



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

...NEBRASKA

Soil Survey Investigations Report No. 5

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

...NEBRASKA

August 1966

SOIL CONSERVATION SERVICE · U.S. DEPARTMENT OF AGRICULTURE
In cooperation with
CONSERVATION AND SURVEY DIVISION · UNIVERSITY OF NEBRASKA

1. SAMPLE COLLECTION AND PREPARATION
 - A. Field sampling
 1. Site selection
 2. Soil sampling
 - a. Stony soils
 - B. Laboratory preparation
 1. Standard (airdry)
 - a. Square-hole 2-mm sieve
 - b. Round-hole 2-mm sieve
 2. Field moist
 3. Carbonate-containing material
 4. Carbonate-undrained material
 2. CONVENTIONS
 - A. Size-fraction base for reporting
 1. <2-mm
 2. <size specified
 - B. Data-sheet symbols

tr: trace, not measurable by quantitative procedure used or less than reportable amount

tr(s): trace, detectable only by qualitative procedure more sensitive than quantitative procedure used

--: analysis run but none detected

-(s): none detected by sensitive qualitative test

blank: analysis not run

nd: analysis not run

<: less than reported amount or none present
 3. PARTICLE-SIZE ANALYSES
 - A. <2-mm fraction (pipet method)
 1. Airdry samples
 - a. Carbonate and noncarbonate clay
 2. Moist samples
 - a. Carbonate and noncarbonate clay
 - B. >2-mm fraction
 1. Weight estimates
 2. Volume estimates
 4. FABRIC-RELATED ANALYSES
 - A. Bulk density
 1. Saran-coated clods
 - a. Field state
 - b. Airdry
 - c. 30-cm absorption
 - d. 1/3-bar desorption I
 - e. 1/3-bar desorption II
 - f. 1/3-bar desorption III
 - g. 1/10-bar desorption
 - h. Ovendry
 2. Paraffin-coated clods
 - a. Ovendry
 3. Cores
 - a. Field moist
 4. Nonpolar-liquid-saturated clods
 - B. Water retention
 1. Pressure-plate extraction (1/3 or 1/10 bar)
 - a. Sieved samples
 - b. Soil pieces
 - c. Natural clods
 - d. Cores
 2. Pressure-membrane extraction (15 bars)
 3. Sand table absorption
 4. Field state
 5. Airdry
 - C. Water-retention difference
 1. 1/3 bar to 15 bars
 2. 1/10 bar to 15 bars
 - D. Coefficient of linear extensibility
 1. Dry to moist
 - E. Micromorphology
 1. Thin sections
 - a. Preparation
 - b. Interpretation
 - c. Moved-clay percentage
 5. ION-EXCHANGE PROPERTIES
 - A. Cation-exchange capacity
 1. NH₄OAc, pH 7.0
 - a. Direct distillation
 - b. Displacement, distillation
 - 5A. Cation-exchange capacity (cont.)
 2. NaOAc, pH 8.2
 - a. Centrifuge method
 3. Sum of cations
 - a. Acidity by BaCl₂-TEA, pH 8.2; bases by NH₄OAc, pH 7.0
 4. KOAc, pH 7.0
 5. BaCl₂, pH 8.2
 - a. Barium by flame photometry
 - B. Extractable bases
 1. NH₄OAc extraction
 - a. Uncorrected
 - b. Corrected (exchangeable)
 2. KCl-TEA extraction, pH 8.2
 - C. Base saturation
 1. NH₄OAc, pH 7.0
 2. NaOAc, pH 8.2
 3. Sum of cations
 - D. Sodium saturation (exchangeable Na pcc.)
 1. NaOAc, pH 8.2
 2. NH₄OAc, pH 7.0
 - E. Sodium adsorption ratio
6. CHEMICAL ANALYSES
 - A. Organic carbon
 1. Acid-dichromate digestion
 - a. FeSO₄ titration
 - b. CO₂ evolution, gravimetric
 2. Dry combustion
 - a. CO₂ evolution I
 - b. CO₂ evolution II
 3. Peroxide digestion
 - a. Weight loss
 - B. Nitrogen
 1. Kjeldahl digestion
 - a. Ammonia distillation
 2. Semimicro Kjeldahl
 - a. Ammonia distillation
 - C. Iron
 1. Dithionite extraction
 - a. Dichromate titration
 - b. EDTA titration
 2. Dithionite-citrate extraction
 - a. Orthophenanthroline colorimetry
 3. Dithionite-citrate-bicarbonate extraction
 - a. Potassium-thiocyanate colorimetry
 4. Pyrophosphate-dithionite extraction
 - D. Manganese
 1. Dithionite extraction
 - a. Permanganate colorimetry
 - E. Calcium carbonate
 1. HCl treatment
 - a. Gas volumetric
 - b. Manometric
 - c. Weight loss
 - d. Weight gain
 - e. Titrimetric
 2. Sensitive qualitative method
 - a. Visual, gas bubbles
 - F. Gypsum
 1. Water extract
 - a. Precipitation in acetone
 - G. Aluminum
 1. KCl extraction I, 30 min
 - a. Aluminon I
 - b. Aluminon II
 - c. Aluminon III
 - d. Fluoride titration
 2. KCl extraction II, overnight
 - a. Aluminon I
 3. NH₄OAc extraction
 - a. Aluminon III
 4. NaOAc extraction
 - a. Aluminon III
 - H. Extractable acidity
 1. BaCl₂-triethanolamine I
 - a. Back-titration with HCl
 2. BaCl₂-triethanolamine II
 - a. Back-titration with HCl
 3. KCl-triethanolamine
 - a. Back-titration with NaOH
 - I. Carbonate
 1. Saturation extract
 - a. Acid titration
6. CHEMICAL ANALYSES (cont.)
 - J. Bicarbonate
 1. Saturation extract
 - a. Acid titration
 - K. Chloride
 1. Saturation extract
 - a. Mohr titration
 - b. Potentiometric titration
 - L. Sulfate
 1. Saturation extract
 - a. Gravimetric, BaSO₄
 2. NH₄OAc extraction
 - a. Gravimetric, BaSO₄
 - M. Nitrate
 1. Saturation extract
 - a. PDS acid colorimetry
 - N. Calcium
 1. Saturation extract
 - a. EDTA titration
 2. NH₄OAc extraction
 - a. EDTA-alcohol separation
 - b. Oxalate-permanganate I
 - c. Oxalate-permanganate II
 - d. Oxalate-cerate
 3. NH₄Cl-EtOH extraction
 - a. EDTA titration
 4. KCl-TEA extraction
 - a. Oxalate-permanganate
 - O. Magnesium
 1. Saturation extract
 - a. EDTA titration
 2. NH₄OAc extraction
 - a. EDTA-alcohol separation
 - b. Phosphate titration
 - c. Gravimetric, Mg₂P₂O₇
 3. NH₄Cl-EtOH extraction
 - a. EDTA titration
 - P. Sodium
 1. Saturation extract
 - a. Flame photometry
 2. NH₄OAc extraction
 - a. Flame photometry
 - Q. Potassium
 1. Saturation extract
 - a. Flame photometry
 2. NH₄OAc extraction
 - a. Flame photometry
 - R. Sulfur
 1. NaHCO₃ extraction, pH 8.5
 - a. Methylene blue
 - S. Total phosphorus
 1. Perchloric-acid digestion
 - a. Molybdovanadophosphoric-acid colorimetry
7. MINERALOGY
 - A. Instrumental analysis
 1. Preparation
 - a. Carbonate removal
 - b. Organic-matter removal
 - c. Iron removal
 - d. Particle-size fractionation
 2. X-ray diffraction
 3. Differential thermal analysis
 - B. Optical analysis
 1. Grain studies
 - C. Total analysis
 1. Chemical
 2. X-ray emission spectrography
 - D. Surface area
 1. Glycerol retention
8. MISCELLANEOUS
 - A. Saturated paste, mixed
 1. Saturation extract
 - a. Conductivity
 2. Conductivity, saturated paste
 - B. Saturated paste, capillary rise
 1. Saturation extract
 - a. Conductivity
 - C. pH
 1. Soil suspensions
 - a. Water dilution
 - b. Saturated paste
 - c. KCl
 - D. Ratios
 1. To total clay
 2. To noncarbonate clay
 3. Ca to Mg (extractable)

PREFACE

This publication is one in a new U.S. Department of Agriculture series established to preserve and make available technical information resulting from soil survey investigations. These investigations have been going on for about two decades. Data from them have been distributed in unpublished form to those immediately concerned. Some of the data and descriptions have appeared in technical journals, in regional bulletins, in USDA technical bulletins, and in the text of published soil surveys. But most were not available to all who might use them.

We intend to publish in this series all data from the soil survey laboratories that form reasonably complete characterizations of soils. Already-assembled data and descriptions will be published just as rapidly as they can be prepared for printing. Fragmentary data collected as reference points for specific soil surveys will not be included.

While these data were being assembled, there were many changes in laboratory methods. Some were improved and some new ones were devised. Consequently, laboratory data for different soils cannot always be directly compared without allowance for the method.

The method used is indicated by symbol in the column headings of the data table. These symbols are identified in the code sheet on the opposite page. Each method is described in the first number of this series, "Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples," SSIR No. 1.

Ways of describing soils have also changed. Soil descriptions have become explicit on more and more features. The systems for designating horizons and for classifying soils have been changed.

The soil descriptions published here were prepared as working documents to meet a specific need of a soil survey at the time the soil samples were collected. The soil scientists who wrote them had no idea they would be published. Editing has been limited for the most part to that necessary for conformance to the "Soil Survey Manual." Field textural estimates have been retained, even though some are at variance with the laboratory data, because the field estimates themselves are important data.

There were several reasons for sampling these soils. Some were sampled to study soil genesis, some to facilitate classification, and some to obtain data to permit more useful interpretations. Those sampled for genesis or classification studies do not always fit neatly into our present concepts of soil series. Partly because of these studies, our concepts of some soil series have been modified. As a consequence, the soil series name assigned a soil at the time of sampling is not always the name that would be assigned today. Soil series names in this publication follow 1965 series definitions.

*Soil Survey
Soil Conservation Service*

NEBRASKA

<u>Soil Series</u>	<u>County</u>	<u>Soil Survey No.</u>	<u>Page</u>	<u>Soil Series</u>	<u>County</u>	<u>Soil Survey No.</u>	<u>Page</u>
Adair	Pawnee	S58Nebr-67-5	3	Marshall	Washington	S57Nebr-89-5	119
Altvan	Kimball	S57Nebr-53-11	5		Washington	S57Nebr-89-8	121
	Kimball	S57Nebr-53-12	7		Washington	S57Nebr-89-9	123
Anselmo	Custer	S60Nebr-21-1	9	Mitchell	Scotts Bluff	S53Nebr-79-4	125
Belfore	Cuming	S55Nebr-20-1	11		Scotts Bluff	S53Nebr-79-2	127
	Cuming	S55Nebr-20-2	13	Monona	Washington	S57Nebr-89-3	129
	Madison	S54Nebr-60-1	15		Washington	S57Nebr-89-10	131
	Platte	S54Nebr-71-1	17	Moody	Dixon	S55Nebr-26-1	133
Bridgeport	Dundy	S57Nebr-29-1	19		Dixon	S59Nebr-26-1	135
	Dundy	S57Nebr-29-2	21		Wayne	S54Nebr-90-2	137
	Dundy	S57Nebr-29-4	23	*Morrill	Saunders	S58Nebr-78-2	139
Burchard	Saunders	S58Nebr-78-1	25		Saunders	S58Nebr-78-4	141
	Saunders	S58Nebr-78-5	27	Nora	Dixon	S59Nebr-26-2	143
Canyon	Kimball	S57Nebr-53-8	29		Dixon	S55Nebr-26-2	145
	Kimball	S57Nebr-53-9	31	Pawnee	Pawnee	S58Nebr-67-1	147
Cass	Saunders	S53Nebr-78-4	33		Pawnee	S58Nebr-67-3	149
Crete	Clay	S60Nebr-18-1	35	Rosebud	Kimball	S57Nebr-53-1	151
	Fillmore	S55Nebr-30-1	37		Kimball	S57Nebr-53-2	153
	Fillmore	S55Nebr-30-2	39		Kimball	S57Nebr-53-5	155
	Saline	S55Nebr-76-1	41		Kimball	S57Nebr-53-6	157
	Saline	S55Nebr-76-2	43		Kimball	S57Nebr-53-7	159
Crofton	Dixon	S59Nebr-26-3	45		Kimball	S57Nebr-53-10	161
Dawes	Deuel	S58Nebr-25-3	47	Sharpsburg	Cass	S54Nebr-13-1	163
	Deuel	S58Nebr-25-4	49		Cass	S54Nebr-13-2	165
Exline	Hall	S51Nebr-40-7	51		Saunders	S58Nebr-78-3	167
Goshen	Deuel	S58Nebr-25-1	53		Saunders	S58Nebr-78-6	169
	Deuel	S58Nebr-25-2	55		Washington	S57Nebr-89-4	171
Hall	Hall	S51Nebr-40-11	57		Washington	S57Nebr-89-6	173
	Hall	S52Nebr-40-2	59		Washington	S57Nebr-89-7	175
Hastings	Adams	S59Nebr-1-1	61	Silver Creek	Buffalo	S52Nebr-10-1	177
	Adams	S61Nebr-1-1	63		Buffalo	S52Nebr-10-2	179
	Clay	S54Nebr-18-1	65		Hall	S51Nebr-40-9	181
	Clay	S54Nebr-18-2	67	Thurman	Antelope	S60Nebr-2-1	183
	York	S54Nebr-93-1	69		Dixon	S59Nebr-26-4	185
	York	S54Nebr-93-2	71		Dixon	S59Nebr-26-5	187
Holdrege	Phelps	S54Nebr-69-1	73		Pierce	S60Nebr-70-1	189
	Phelps	S54Nebr-69-2	75	Tripp	Scotts Bluff	S61Nebr-79-1	191
Hord	Buffalo	S50Nebr-10-2	77		Scotts Bluff	S61Nebr-79-2	193
	Hall	S51Nebr-40-12	79		Scotts Bluff	S53Nebr-79-6	195
	Hall	S52Nebr-40-4	81		Scotts Bluff	S53Nebr-79-7	197
	Hall	S52Nebr-40-5	83	Ulysses	Scotts Bluff	S53Nebr-79-1	199
Keith	Deuel	S58Nebr-25-5	85	Valentine	Arthur	S54Nebr-3-2	201
	Deuel	S58Nebr-25-6	87		Cherry	S54Nebr-16-1	203
	Hitchcock	S54Nebr-44-2	89		Cherry	S54Nebr-16-2	205
	Hitchcock	S54Nebr-44-3	91	Volin	Saunders	S53Nebr-78-2	207
	Kimball	S57Nebr-53-3	93	Wabash	Pawnee	S58Nebr-67-4	209
	Kimball	S57Nebr-53-4	95		Pawnee	S58Nebr-67-8	211
Kenesaw	Hall	S54Nebr-40-1	97	Wann	Hall	S53Nebr-40-3	213
	Hamilton	S54Nebr-41-1	99		Hall	S53Nebr-40-2	215
*Keota	Scotts Bluff	S53Nebr-79-3	101		Hall	S53Nebr-40-6	217
	Scotts Bluff	S53Nebr-79-5	103	Wood River	Hall	S50Nebr-40-2	219
Lamoure	Dodge	S53Nebr-27-3	105		Hall	S51Nebr-40-6	221
Leshare	Dodge	S53Nebr-27-4	107		Hall	S51Nebr-40-8	223
	Hall	S53Nebr-40-4	109		Hall	S51Nebr-40-10	225
	Merrick	S53Nebr-61-1	111	Wymore	Lancaster	S60Nebr-55-1	227
	Saunders	S53Nebr-78-3	113		Lancaster	S61Nebr-55-1	229
Luton	Washington	S57Nebr-89-1	115		Pawnee	S58Nebr-67-2	231
	Washington	S57Nebr-89-2	117		Pawnee	S58Nebr-67-7	233

*Soil series names preceded by an asterisk are names of tentative series.

NEBRASKA

County	Soil Series	Soil Survey No.	Page	County	Soil Series	Soil Survey No.	Page
Adams	Hastings	S59Nebr-1-1	61	Kimball	Canyon	S57Nebr-53-8	29
	Hastings	S61Nebr-1-1	63		Canyon	S57Nebr-53-9	31
Antelope	Thurman	S60Nebr-2-1	183		Keith	S57Nebr-53-3	93
Arthur	Valentine	S54Nebr-3-2	201		Keith	S57Nebr-53-4	95
Buffalo	Hord	S50Nebr-10-2	77		Rosebud	S57Nebr-53-1	151
	Silver Creek	S52Nebr-10-1	177		Rosebud	S57Nebr-53-2	153
	Silver Creek	S52Nebr-10-2	179		Rosebud	S57Nebr-53-5	155
Cass	Sharpsburg	S54Nebr-13-1	163		Rosebud	S57Nebr-53-6	157
	Sharpsburg	S54Nebr-13-2	165		Rosebud	S57Nebr-53-7	159
Cherry	Valentine	S54Nebr-16-1	203		Rosebud	S57Nebr-53-10	161
	Valentine	S54Nebr-16-2	205	Lancaster	Wymore	S60Nebr-55-1	227
Clay	Crete	S60Nebr-18-1	35		Wymore	S61Nebr-55-1	229
	Hastings	S54Nebr-18-1	65	Madison	Belfore	S54Nebr-60-1	15
	Hastings	S54Nebr-18-2	67	Merrick	Leshara	S53Nebr-61-1	111
Cuming	Belfore	S55Nebr-20-1	11	Pawnee	Adair	S58Nebr-67-5	3
	Belfore	S55Nebr-20-2	13		Pawnee	S58Nebr-67-1	147
Custer	Anselmo	S60Nebr-21-1	9		Pawnee	S58Nebr-67-3	149
Deuel	Dawes	S58Nebr-25-3	47		Wabash	S58Nebr-67-4	209
	Dawes	S58Nebr-25-4	49		Wabash	S58Nebr-67-8	211
	Goshen	S58Nebr-25-1	53		Wymore	S58Nebr-67-2	231
	Goshen	S58Nebr-25-2	55		Wymore	S58Nebr-67-7	233
	Keith	S58Nebr-25-5	85	Phelps	Holdrege	S54Nebr-69-1	73
	Keith	S58Nebr-25-6	87		Holdrege	S54Nebr-69-2	75
Dixon	Crofton	S59Nebr-26-3	45	Pierce	Thurman	S60Nebr-70-1	189
	Moody	S55Nebr-26-1	133	Platte	Belfore	S54Nebr-71-1	17
	Moody	S59Nebr-26-1	135	Saline	Crete	S55Nebr-76-1	41
	Nora	S59Nebr-26-2	143		Crete	S55Nebr-76-2	43
	Nora	S55Nebr-26-2	145	Saunders	Burchard	S58Nebr-78-1	25
	Thurman	S59Nebr-26-4	185		Burchard	S58Nebr-78-5	27
	Thurman	S59Nebr-26-5	187		Cass	S53Nebr-78-4	33
Dodge	Lamoure	S53Nebr-27-3	105		Leshara	S53Nebr-78-3	113
	Leshara	S53Nebr-27-4	107		*Morrill	S58Nebr-78-2	139
Dundy	Bridgeport	S57Nebr-29-1	19		*Morrill	S58Nebr-78-4	141
	Bridgeport	S57Nebr-29-2	21		Sharpsburg	S58Nebr-78-3	167
	Bridgeport	S57Nebr-29-4	23		Sharpsburg	S58Nebr-78-6	169
Fillmore	Crete	S55Nebr-30-1	37		Volin	S53Nebr-78-2	207
	Crete	S55Nebr-30-2	39	Scotts Bluff	*Keota	S53Nebr-79-3	101
Hall	Exline	S51Nebr-40-7	51		*Keota	S53Nebr-79-5	103
	Hall	S51Nebr-40-11	57		Mitchell	S53Nebr-79-4	125
	Hall	S52Nebr-40-2	59		Mitchell	S53Nebr-79-2	127
	Hord	S51Nebr-40-12	79		Tripp	S61Nebr-79-1	191
	Hord	S52Nebr-40-4	81		Tripp	S61Nebr-79-2	193
	Hord	S52Nebr-40-5	83		Tripp	S53Nebr-79-6	195
	Kenesaw	S54Nebr-40-1	97		Tripp	S53Nebr-79-7	197
	Leshara	S53Nebr-40-4	109		Ulysses	S53Nebr-79-1	199
	Silver Creek	S51Nebr-40-9	181	Washington	Luton	S57Nebr-89-1	115
	Wann	S53Nebr-40-3	213		Luton	S57Nebr-89-2	117
	Wann	S53Nebr-40-2	215		Marshall	S57Nebr-89-5	119
	Wann	S53Nebr-40-6	217		Marshall	S57Nebr-89-8	121
	Wood River	S50Nebr-40-2	219		Marshall	S57Nebr-89-9	123
	Wood River	S51Nebr-40-6	221		Monona	S57Nebr-89-3	129
	Wood River	S51Nebr-40-8	223		Monona	S57Nebr-89-10	131
	Wood River	S51Nebr-40-10	225		Sharpsburg	S57Nebr-89-4	171
Hamilton	Kenesaw	S54Nebr-41-1	99		Sharpsburg	S57Nebr-89-6	173
Hitchcock	Keith	S54Nebr-44-2	89		Sharpsburg	S57Nebr-89-7	175
	Keith	S54Nebr-44-3	91	Wayne	Moody	S54Nebr-90-2	137
Kimball	Altvan	S57Nebr-53-11	5	York	Hastings	S54Nebr-93-1	69
	Altvan	S57Nebr-53-12	7		Hastings	S54Nebr-93-2	71

*Soil series names preceded by an asterisk are names of tentative series.

SOIL SURVEY LABORATORY Lincoln, Nebr.

SOIL TYPE Adair LOCATION Pawnee County, Nebraska
silty clay loam

SOIL NOS. S58Nebr-67-5 LAB. NOS. 9162-9168
(S58(62)Nebr-67-5) (17437-17444)

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										2A2 > 2 (19mm)
		1B1b VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	0.002-0.0002	
		0-5	Alp	0.6a	3.5a	6.4a	8.6a	5.2a	47.3	28.4	39.5	
5-10	B21	0.5a	3.0a	3.4a	4.2a	2.6a	38.9	47.4	26.6	17.2	Tr.	
10-19	B22	0.6a	2.4a	3.2a	4.0a	3.1a	40.3	46.4	26.9	18.4	Tr.	
19-28	B23	0.6a	2.2a	3.1a	3.9a	3.7a	43.2	43.3	29.1	19.7	Tr.	
28-37	B24	1.1b	2.5b	2.8b	4.6b	4.2b	44.2	40.6	30.8	19.7	Tr.	
37-48	B31	1.4b	3.2b	3.5b	6.1b	5.2b	44.4	36.2	32.2	20.3	Tr.	
48-60	B32	1.4a	2.8a	3.3a	5.9a	5.8a	45.4	35.4	35.3	18.8	Tr.	
60-72	B33	2.7	6.4	7.7	12.9	9.3	36.3	24.7	31.9	13.6	Tr.	

pH	8C1b Paste	8C1a 1:1 CaCO ₃ %	6E1b ORGANIC MATTER			Bulk Density			Water Content			
			6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N	4A1a Field- State g/cc	4A1b Air- Dry g/cc	4B1a Field- State %	4B1c 1/3-Bar %	4B2 15- Bar %	4C1 1/3- minus 15-Bar in./hor.	
			6.5	6.6	1.62	0.143	11.3	1.48	1.38	1.55	14.8	20.3
5.7	6.0	1.12	0.086	13.0	1.47	1.36	1.75	21.7	25.9	19.8	0.4	
6.3	6.6	0.78	0.070	11.	1.49	1.35	1.85	23.6	27.8	19.9	1.0	
7.2	7.5	-	0.52	0.048	11.	1.60	1.43	1.92	21.2	26.1	18.5	1.0
7.7	8.0	1	0.22		1.64	1.46	1.92	19.0	25.4	17.7	1.0	
7.6	8.0	Tr.	0.11		1.70		1.83	15.9		15.6		
7.4	8.0	Tr.	0.03		1.68	1.48	1.86	18.1	24.1	15.5	1.5	
7.1	7.6	-	0.03		1.72	1.57	1.80	16.1	18.9	10.0	1.7	

5A1a CATION EXCHANGE CAPACITY NH ₄ %	EXTRACTABLE CATIONS 5B1a					SAT. EXT. SOL. 6A1			8A Moist. at Sat. %	5D2 Exch. Na %	8A1a Elec. Cond. mhos/cm.	6C2a Free Iron as Fe ₂ O ₃ %
	6B2a Ca	6C2a Mg	6D1a NH ₄ Ext.	6F2a Na	6G2a K	5A3a Sum	6F1a Na	6Q1a K				
	milliequivalents per 100g. soil					→ me. per liter →						
20.0	14.7	3.7	4.0	0.2	0.6	23.2	0.9	0.2	52.9	1	0.5	1.3
28.4	17.7	7.1	7.9	0.9	0.5	34.1	1.7	0.1	71.5	3	0.2	1.9
27.6	18.8	7.5	4.6	1.3	0.5	32.7	2.2	0.1	76.6	4	0.4	1.7
27.8	19.4	7.3	2.1	1.6	0.5	30.9	3.4	Tr.	77.4	5	0.5	1.5
26.5	20.6	7.4	0.8	2.0	0.5	31.3	4.2	0.1	72.0	6	0.7	1.4
23.6	17.0	6.8	1.2	1.1	0.4	26.5	3.8	Tr.	66.5	4	0.6	1.4
22.5	16.2	6.1	0.8	1.8	0.4	25.3	3.6	Tr.	62.5	7	0.6	1.6
15.4	10.8	4.2	0.9	1.3	0.4	17.6	4.1	Tr.	43.0	7	1.1	1.5

a. < 5% Fe-Mn nodules.
b. < 5% Fe-Mn nodules. 5-25% carbonate nodules.
c. 10 Kg/M² to 60 inches.

Soil type: Adair silty clay loam

Soil No.: S58Nebr-67-5 and S58(62)Nebr-67-5 (revised)

Classification: Brunizem

Location: 170 feet south and 200 feet west of NE corner Sec. 29, T1N, R11E, about 2 miles west and 5 miles south of Pawnee City, Pawnee County, Nebraska.

Date sampled: September 15, 1958.

Collectors: J. S. Allen and J. A. Elder.

Use: Cultivated (alfalfa and brome).

Climate: Average annual precipitation 31 inches. Average annual temperature 53° F.

Physiography: Rolling glacial upland.

Parent material: Glacial till.

Slope: 4 percent southwest.

Lincoln

Lab. No.	Horizon	Description
9162 (17437)	Alp	0-5 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) silty clay loam; moderate fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9163 (17438)	B21	5-10 inches. Dark reddish brown (5YR 3/3 dry) to dark brown (7.5YR 3/2 moist) silty clay; with common fine distinct reddish brown mottles; moderate fine blocky structure, continuous clay films on the aggregates; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9164 (17439)	B22	10-19 inches. Reddish brown (5YR 4/3 dry) to dark reddish brown (5YR 3/2 moist) clay with common fine distinct reddish brown mottles; moderate coarse prismatic primary to strong medium and fine blocky secondary structure; continuous clay films on the aggregates; plastic wet, firm moist, hard dry; noncalcareous; clear smooth lower boundary.
9165 (17440)	B23	19-28 inches. Reddish brown (5YR 4/4 dry) to dark reddish brown (5YR 3/3 moist) clay; common fine distinct dark reddish brown and dark brown mottles; moderate coarse prismatic primary to strong medium blocky secondary structure; continuous clay films and aggregates coated with dark material from above; plastic wet, very firm moist, hard dry; noncalcareous; gradual smooth lower boundary.
9166 (17441)	B24	28-37 inches. Yellowish red (5YR 5/6 dry) to dark reddish brown (5YR 3/4 moist) clay; moderate coarse prismatic primary to strong medium blocky secondary structure, continuous clay films on aggregates; plastic wet, very firm moist, hard dry; the soil matrix is noncalcareous with a few small lime concretions; clear smooth lower boundary.
9167 (17442)	B31	37-48 inches. Mottled strong brown (7.5YR 5/8 dry) to 75 percent dark brown (7.5YR 4/4 moist) and 25 percent dark reddish brown (5YR 3/4 moist) clay; moderate medium and coarse prismatic primary to strong medium blocky secondary structure; thin continuous clay films on aggregates; plastic wet, very firm moist, hard dry; the soil is noncalcareous but a few small hard lime concretions are present; gradual smooth lower boundary.
9168 (17443)	B32	48-60 inches. Reddish yellow (7.5YR 6/6 dry) to dark brown (7.5YR 4/4 moist) clay; strong medium prismatic primary to strong medium blocky secondary structure; thin continuous clay films on aggregates; plastic wet, firm moist, hard dry; common medium and fine dark brown iron and manganese concretions present. A few small lime concretions present, although the soil matrix is noncalcareous.
(17444)	B33	60-72 inches. Yellowish brown (10YR 5/6) clay loam with a few medium distinct light brownish gray mottles, and with prominent, patchy brown (7.5YR 5/4) illuviation cutans on planar surfaces and on pore walls; weak very coarse prismatic with prisms massive; firm; ruptures semiplastically at sampling moisture; slightly sticky and plastic; patches of black MnO ₂ (?) as coatings in a crude dendritic pattern on planar surfaces and as fairly complete coatings on the walls of some pores; black coatings appear to coat or interpenetrate with the illuvial clay cutans; occasional pocket and stringer of moved clay 1/8-inch thick; some of the thicker bodies of moved clay are very dark grayish brown.

Remarks: The pit was reopened in 1962 by George Holmgren, John Millet, Jim Drew and Robert Grossman. The sampling was extended downward 12 inches. Samples were taken for moisture retention, bulk density, and for mineralogical studies. The latter are to be done by John Millet as part of his Master of Science thesis project. The laboratory numbers in parentheses are for the 1962 samples.

SOIL TYPE Altvan Loam, deep LOCATION Kimball County, Nebraska

SOIL NOS. S57Nebr-53-11-(1-9) LAB. NOS. 5855-5863

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002 (< 0.001)	> 2		
0-6	Alp	8.3	12.1	6.5	8.1	14.8	33.4	16.8	30.4	13.7	8	1	
6-8	Al2	10.0	11.2	5.8	7.7	14.5	33.4	17.4	38.5	13.2	7	1	
8-11	Bl	8.4	10.0	5.1	6.4	11.8	33.7	24.6	35.2	13.4	7	1	
11-17	B21	5.4a	8.1a	4.9a	5.6a	12.3a	36.4	27.3	37.0	14.9	3	cl	
17-21	B22	3.6a	5.2a	3.1a	4.4a	16.1a	42.5	25.1	44.8	16.4	3	1	
21-27	Bca	4.0a	5.5a	3.3a	6.3a	19.4a	39.6	21.4	47.0	15.8	3	1	
27-32	C1	7.0b	10.4b	7.0a	11.1a	22.4a	26.4	15.1	46.2	9.6	6	fs1	
32-36	D1	9.8b	15.4b	10.4a	14.4a	17.5a	18.1	14.4	36.5	7.3	15	cos1/sl	
36-41	D2	40.4b	29.4b	7.5a	3.8a	1.4a	2.5	15.0	3.8	1.9	50	cos1	

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY		6E1a		MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	C/N	EST. SALT (BUPEAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
	1:5	1:10	ORGANIC CARBON %	NITROGEN %			8A1a	%		%	%	%	
6.7	6.8	7.3	1.22	.100	11.3	<0.20	0.8	-	-	-	-	7.8	
5.7	6.9	7.4	1.42	.108	13.1	<0.20	0.9	-	-	-	-	8.4	
6.9	7.3	7.8	0.58	.063	9.2	<0.20	0.7	-	-	-	-	11.0	
7.0	7.5	7.9	0.52	.059	8.8	<0.20	0.7	-	-	-	-	12.1	
7.4	7.8	8.6	0.66	.078	8.5	<0.20	0.7	-	-	-	-	12.2	
7.6	8.1	8.8	0.59	.068	8.7	<0.20	0.7	9	-	-	-	11.4	
7.7	8.3	9.1	0.30			<0.20	0.8	8	-	-	-	7.7	
7.8	8.4	9.2	0.25			<0.20	0.8	5	-	-	-	6.5	
7.9	8.5	9.3	0.12			<0.20	0.8	6	-	-	-	6.2	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					5D2	5A1 SAT. EXT. SOL.		4A3a Vol. Wt. g/cc	8A MOISTURE AT SATURATION %
	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a		
	Ca	Mg	H	Na	K		Na	K		
14.9	10.1	2.3	3.5	-	1.8	-	0.3	1.7		37.3
15.3	11.0	2.3	2.3	-	1.8	-	0.3	1.7		35.4
18.3	13.1	3.3	2.0	-	1.7	-	0.3	1.0		42.7
20.6	14.6	4.4	2.0	-	1.7	-	0.2	0.9	1.45	49.4
24.6				-	1.9	-	0.3	0.8		50.9
18.9				-	1.6	-	0.2	0.9	1.27	46.9
14.2				-	1.7	-	0.5	1.2	1.54	32.4
11.8				0.1	1.6	1	0.6	1.4		29.1
11.0				0.2	1.5	2	1.6	1.4		23.8

a. Few irregular black concr. (Fe-Mn).
 b. Few irregular black concr. (Fe-Mn) Also few, CaCO₃ concr.

Soil type: Altvan loam, deep

Location: Kimball County, Nebraska. 300 feet north and 65 feet west of SE corner Sec. 30, T16N, R57W. About 6 miles north of Bushnell, Nebraska.

Topography: About a 1 percent south facing slope on a loess-covered gravel Tertiary plain. Gravels assumed to be of Pleistocene age.

Cultivation: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: 857Nebr-53-11-(1-9)

Lincoln

Lab.No.	Horizon	
5855	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5856	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary.
5857	B1	8-11 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) loam; weak coarse subangular blocky; friable, moist; clear smooth lower boundary.
5858	B21	11-17 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; broken clay skins on vertical and horizontal faces.
5859	B22	17-21 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) heavy silt loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; friable, moist; clear smooth lower boundary.
5860	Bca	21-27 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; disseminated line occurring along structural faces and along root channels; few scattered gravels present; clear smooth lower boundary.
5861	C1	27-32 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) heavy fine sandy loam; massive structure; very friable, moist; violent effervescence; gradual smooth lower boundary; fine and coarse gravel mixed through horizon; a 2-inch Krotovina present, filled with dark colored surface material.
5862	D1	32-36 inches. Very pale brown (10YR 7/3 dry) to yellowish brown (10YR 5/4 moist) gravelly sandy loam; massive structure; very friable, moist.
5863	D2	36-41 inches. Pleistocene sand and gravel (5YR 6/4 moist) matrix; sticky uniform coarse sand.

Note: Numerous fine and coarse gravels present on the surface and throughout the profile. Horizons Alp, B21, and C1 were sampled for the Bureau of Public Roads.

SOIL TYPE Altvan

LOCATION Kimball County, Nebraska

loam, deep

SOIL NOS. S57Nebr-53-12-(1-9)

LAB. NOS. 5864-5872

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2	< 0.002		
0-6	A1p	16.6	13.8a	5.4a	4.4a	11.4a	34.1	14.3	33.4	14.4	12	1
6-8	A12	12.1	14.3a	5.3a	4.9a	9.9a	34.9	18.1	32.3	14.5	11	1
8-12	B1	4.2	10.5a	5.6a	5.9a	12.6a	38.7	22.5	38.3	15.6	6	1
12-18	B21	6.6	5.6a	2.2a	2.4a	10.8a	41.0	31.4	36.3	16.6	3	cl
18-23	E22	2.3	2.4a	1.1a	1.6a	15.3a	50.6	26.7	47.0	19.9	2	sil
23-26	Bca	0.7b	1.8b	1.4a	1.9a	17.6a	56.6	20.0	51.1	24.3	1	sil
26-32	C1	2.7b	4.5b	2.9a	3.1a	17.8a	47.3	21.7	45.9	20.9	5	1
32-35	D1	24.4b	19.8b	8.4a	7.5a	7.8a	17.2	14.9	20.5	7.3	23	coal
35-40	D2	42.2b	36.4b	9.8a	4.4a	0.9a	1.5	4.8	2.4	1.0	21	cos

pH	ORGANIC MATTER					8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM AT 25°C	6E1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	4B2						
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N				EST% SALT (BUREAU CUP)	CaCO ₃ eq. v. acid	GYPSUM no./100g. SOIL
6.5	6.6	7.2	1.12	.094	11.9	<0.20	0.5	-	-	-	7.2
6.4	6.7	7.2	0.77	.074	10.4	<0.20	0.6	-	-	-	8.2
6.6	7.0	7.4	0.52	.055	9.4	<0.20	0.6	-	-	-	9.9
6.7	7.1	7.8	0.56	.062	9.0	<0.20	0.5	7	-	-	13.8
7.2	7.7	8.4	0.58	.073	7.9	<0.20	0.7	5	-	-	13.4
7.7	8.3	9.1	0.61	.075	8.1	<0.20	0.7	7	-	-	13.3
7.8	8.5	9.2	0.37			<0.20	0.7	14	-	-	12.3
7.9	8.5	9.3	0.22			<0.20	0.8	16	-	-	7.1
3.1	8.7	9.4	0.02			<0.20	0.8	1	-	-	2.5

5A1a	EXTRACTABLE CATIONS					5D2	SAT. EXT. SOL.		4A3a	8A
	6N2b	6O2b	6H1a	6P2a	6Q2a		6P1a	6Q1a		
	Ca	Mg	H	Na	K		Na	K		
13.9	8.4	2.2	3.1	-	1.8	-	0.3	1.4	-	34.9
14.2	9.2	3.0	2.4	-	1.2	-	0.3	0.8	-	33.8
16.5	10.4	4.1	2.0	-	1.3	-	0.3	0.7	-	37.4
24.2	15.0	6.8	2.0	-	2.1	-	0.3	0.8	1.37	53.8
25.2	17.8	8.2	0.8	0.1	2.6	-	0.4	1.0	-	50.4
23.2				0.1	2.6	-	0.6	1.2	1.26	55.1
18.6				0.2	2.4	-	1.0	1.3	-	46.0
11.0				0.2	1.5	2	1.5	1.4	-	28.0
4.5				0.1	0.7	2	2.0	1.3	-	20.3

a. few irregular black condr. (Fe-Mn).
 b. few irregular black condr. (Fe-Mn) also few CaCO₃ condr.

Soil type: Altvan loam, deep

Location: Kimball County, Nebraska. 480 feet west and 60 feet south (center of road) of NE/4 corner Sec. 31, T16N, R58W. About 6 miles north and 6.5 miles west of Bushnell, Nebraska.

Topography: About a 1 percent slope on a loess-covered gravel Tertiary plain. Gravels assumed to be of Pleistocene age.

Cultivation: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-12-(1-9)

Lincoln

Lab.No.	Horizon	Description
5864	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5865	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary.
5866	B1	8-12 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) heavy loam; weak coarse subangular blocky structure; friable, moist; clear smooth lower boundary.
5867	B21	12-18 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; broken clay skins present on vertical and horizontal faces.
5868	B22	18-23 inches. Pale brown (10YR 6/3 moist) to brown (10YR 5/3 moist) heavy silt loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; friable, moist; abrupt smooth lower boundary.
5869	Bca	23-26 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) silt loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; disseminated lime in root channels and on structural faces; clear smooth lower boundary.
5870	C1	26-32 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) light silt loam; weak coarse subangular blocky; very friable, moist; violent effervescence; small amount of disseminated lime present; clear wavy lower boundary.
5871	D1	32-35 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) dirty gravel, about 75% fine to coarse gravel; violent effervescence; gradual wavy lower boundary.
5872	D2	35-40 inches. Pleistocene gravel.

Note: Fine and coarse gravel scattered throughout the profile. The same structure is shown for the B21 and B22 but the grade is stronger in the B21 horizon. Horizons Alp, B21 and C1 were sampled for the Bureau of Public Roads.

SOIL Anselmo loamy fine sand SOIL Nos. 860Nebr-21-1 LOCATION Quater County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 13461-13466 December 1964

Depth (in.)	Horizon	1R1a Size class and particle diameter (mm) 3A1											Coarse fragments			
		Total			Sand					Silt			2A2 > 2	2A2 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																
0-6	A1p	80.8	13.6	5.6	-	1.7	8.0	41.6	29.5	11.0	2.6	66.3	51.3	-	-	-
6-11	A12	63.7	25.2	11.1	-	0.7	4.6	28.7	29.7	22.1	3.1	69.8	34.0	-	-	-
11-22	AC	68.1	22.5	9.4	-	0.2	1.9	30.7	35.3	19.7	2.8	77.1	32.8	-	-	-
22-38	C1	68.0	22.5	9.5	-	0.2	0.8	28.3	38.7	19.3	3.2	80.6	29.3	-	-	-
38-50	C2	86.6	7.8	5.6	-	0.6	4.8	45.3	35.9	7.4	0.4	75.0	50.7	-	-	-
50-60	C3	74.1	18.3	7.6	-	0.6	5.5	40.3	27.7	15.9	2.4	70.0	46.4	-	-	-
Pct. of < 75mm																
Pct. of < 2 mm																
Depth (in.)	6A1a	6B1a	C/N	6E1c Carbonate as CaCO ₃	6C1a Ext. Iron as Fe ₂ O ₃	Bulk density			Water content			pH				
	Organic carbon Pct.	Nitrogen Pct.				4A1a Field-State	g/cc	g/cc	g/cc	4B1a Field-State	4B1a 1/10-Bar	4B2 15-Bar	8C1a (1.1) H ₂ O			
0-6	0.44	0.041	11		0.2									6.7		
6-11	0.37	0.043	9		0.3	1.51				17.4	23.0			6.5		
11-22	0.16	0.024			0.3									6.7		
22-38	0.12	0.015		-	0.2	1.47				11.2	21.9			7.4		
38-50	0.06			tr.	0.2									8.1		
50-60	0.07			tr.	0.2									8.2		
Depth (in.)	Extractable bases 5B1a					6H1a Ext. Acidity	Cat. Exch. Cap		8D3 Ca/Mg	Base saturation						
	6B2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum	5A3a Sum	5A1a NH ₄ OAc	5C3 Sum Cat-ions Pct.		5C1 NH ₄ OAc CEC Pct.						
0-6	4.2	0.9	tr.	0.6	5.7	1.2	6.9	5.4			83	106				
6-11	6.8	1.8	tr.	0.5	9.1	2.0	11.1	9.3	3.8		82	98				
11-22	6.0	1.8	tr.	0.3	8.1	1.2	9.3	8.2	3.3		87	99				
22-38	7.1	2.1	tr.	0.5	9.7	1.8	11.5	8.7	3.4		84	111				
38-50			tr.	0.3				4.5								
50-60			tr.	0.5				6.7								
Depth (in.)	Ratios to Clay 8M1			15-Bar Water												
	NH ₄ OAc CEC															
0-6	0.96			0.5												
6-11	0.84			0.5												
11-22	0.87			0.5												
22-38	0.92			0.5												
38-50	0.80			0.4												
50-60	0.88			0.5												

Soil type: Anselmo loamy fine sand

Soil No.: S50Nebr-21-1

Location: 190 feet east of center of west road and 300 feet north of center of road to south or 1050 feet south and 190 feet east of north 1/4 corner, Sec. 35, T20N, R22W, Custer County, Nebraska.

Physiography: Upland valley.

Relief: Undulating.

Slope: 2 to 3 percent; ridge top southeast slope.

Parent material: Eolian sands and silts.

Drainage: Good.

Permeability: Moderately rapid.

Land use: Cultivated; in corn.

Described by: Herbert L. Kollmorgen and John Elder, June 1960.

Horizon and

Lincoln

Lab. Number

Alp 13461	0 to 6 inches. Very dark to dark grayish brown (10YR 3.5/2 moist) loamy fine sand; weak fine crumb breaking to single grained structure; very friable moist; no effervescence; abrupt smooth boundary. This surface texture is believed to be a fine sandy loam before wind erosion affected surface.
A12 13462	6 to 11 inches. Dark grayish brown (10YR 4/2 moist) fine sandy loam to very fine sandy loam; weak coarse and medium blocky breaking to weak fine subangular blocky structure; very friable moist; no effervescence; gradual wavy boundary.
AC 13463	11 to 22 inches. Grayish brown to dark grayish brown (10YR 4.5/2 moist) fine sandy loam; weak medium subangular blocky breaking to fine and very fine subangular blocky structure; very friable moist; many fine channels or pores and openings; no effervescence; gradual wavy boundary.
C1 13464	22 to 38 inches. Grayish brown (10YR 5/2 moist) fine sandy loam; weak coarse and medium subangular blocky breaking to single grained structure; very friable moist; no effervescence; gradual wavy boundary.
C2 13465	38 to 50 inches. Light brownish gray to grayish brown (10YR 5.5/2 moist) fine sand; single grained; loose moist; clear smooth boundary.
C3 13466	50 to 60 inches. Stratified dark grayish brown and grayish brown (10 percent 2.5Y 4/2 and 90 percent 10YR 5.5/2 moist) stratified very fine sandy loam and fine sandy loam; platy breaking to single grained structure; very friable moist; slight effervescence; gradual smooth boundary.

SOIL TYPE Belfore LOCATION Cuming County, Nebraska
 silty clay loam

SOIL NOS. S-55-Nebr-20-1-(1-8) LAB. NOS. 2824-2831

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a 3A1										
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.20-0.02	0.02-0.002	2A2 > 2	
0-7	Alp	-	0.1	0.1	0.2	3.0	61.2	35.4	40.9	23.4	-	sic1
7-14	Al2	-	0.1	0.1	0.2	1.7	58.9	39.0	33.4	27.3	-	sic1
14-19	B1	-	0.1	-	0.2	1.7	57.1	40.9	30.7	28.2	-	sic
19-25	B21	-	0.1	0.1	0.2	1.7	57.9	40.0	32.3	27.4	-	sic/sic1
25-39	B22	-	-	0.1	0.2	2.2	61.0	36.5	36.1	27.2	-	sic1
39-48	B23	-	-	-	0.2	3.4	63.4	33.0	40.8	26.1	-	sic1
48-55	B3	-	-	0.1	0.3	4.1	63.2	32.3	41.8	25.6	-	sic1
55-60	C	-	0.1	0.1	0.3	5.3	64.6	29.6	46.8	23.3	-	sic1

pH	ORGANIC MATTER					EST% SALT (BUREAU CUP)	ELECTRI-CAL CONDUCTIVITY EC=10 ³ MILLIMHOS PER CM @25°C	CaCO ₃ equiv-alewt %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS		
	6A1a		6B1a		C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITRO-GEN %								
5.8	6.1	5.9	2.41	.213	11.3							14.2
5.9	6.2	6.3	1.80	.163	11.0							16.1
6.0	6.2	6.5	1.10	.102	10.8							16.8
6.1	6.3	6.4	0.75	.070	10.7							16.7
6.0	6.4	6.6	0.50									15.9
6.3	6.3	6.4	0.35									15.1
6.4	6.5	6.7	0.21									15.3
6.5	6.6	6.8	0.22									14.6

5A1a CATION EXCHANGE CAPACITY NH4Ac	EXTRACTABLE CATIONS					5E1a BASE SAT. %	4A3a Vol. Wt. g/cc	MOISTURE AT SATURATION %
	6N2b		6P2a		6Q2a			
	Ca	Mg	H	Na				
28.2	17.1	6.5		0.1	1.3	89		
28.8	17.3	6.6		0.1	0.7	86	1.18	
29.9	18.8	7.9		-	0.6	91		
30.4	19.3	8.5		0.1	0.6	94		
29.1	18.9	8.1		0.1	0.6	95	1.42	
27.1	18.2	7.6		0.3	0.5	98		
27.3	18.7	7.0		0.2	0.5	97		
26.5	18.7	7.4		0.2	0.4	100	1.25	

Soil type: Belfore silty clay loam

Soil No.: S55Nebr-20-1-(1-8)

Location: .2 mile east and 100 feet north of southwest corner Sec. 17, T23N, R7E, Cuming County, Nebraska; 8 miles north and 3 miles east of West Point, Nebraska; 8 miles east and 3 miles north of Beemer, Nebraska.

Physiography: Nearly level plain; 1/2 to 1 percent southeast 1/2-mile long slope; about 200 feet north of shallow swale-like drain.

Use: Cultivated, corn.

Collected by: D. W. DeMoude, H. L. Kollmorgen, B. H. Williams, J. A. Elder, R. D. Greenawalt, T. F. Clapper and J. S. Allen, July 1955.

Described by: B. H. Williams

Horizon and

Mandan

Lab. Number

- A1p 0 to 7 inches. Dark grayish brown to very dark brown (10YR 4/2 dry to 2/2 moist) light silty clay loam; moderate fine and very fine granular structure; soft, dry; very friable, moist; abrupt lower boundary.
2824
- A12 7 to 14 inches. Dark grayish brown to very dark grayish brown (10YR 4/2 dry to 2.5/2 moist) silty clay loam; moderate coarse granular and very fine blocky structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
2825
- B1 14 to 19 inches. Grayish brown to very dark grayish brown (10YR 5/2.5 dry to 3.5/2.5 crushing to 4/2.5 moist) silty clay loam; weak coarse prismatic to moderate fine and very fine blocky structure; weak glaze on ped surfaces; hard, dry; slightly firm, moist; many plant roots in this horizon and the ones above; clear smooth lower boundary.
2826
- B21 19 to 25 inches. Brown to dark brown (10YR 5.5/3 dry to 3/3 moist) heavy silty clay loam; weak coarse prismatic and moderate fine and medium blocky structure; weak to moderate glaze on peds; hard, dry; firm, moist; plant roots common; clear smooth lower boundary.
2827
- B22 25 to 39 inches. Light yellowish brown to olive brown (2.5Y 5.5/3 dry to 4/3 moist) silty clay loam; a very few faint very fine yellowish brown and gray mottles; moderate coarse prismatic and moderate fine and medium blocky structure; brown moderate glaze on peds; hard, dry; firm, moist; plant roots few to common; clear smooth lower boundary.
2828
- B23 39 to 48 inches. Light yellowish brown to olive brown (2.5Y 5.5/4 dry to 4.5/4 moist) silty clay loam; few faint fine gray and yellowish brown mottles; weak coarse prismatic structure; moderate glaze on peds; hard, dry; friable or slightly firm, moist; plant roots few; clear smooth lower boundary.
2829
- B3 48 to 55 inches. Light yellowish brown to light olive brown (2.5Y 6/4 dry to 5/4 moist) silty clay loam; few faint fine gray and yellowish brown mottles and fine dark brown iron-manganese soft concretions; weak coarse prismatic structure; weak glaze on peds; slightly hard, dry; friable, moist; plant roots very few but old root channels common; gradual wavy lower boundary.
2830
- C 55 to 60 inches. Pale yellow to light olive brown (2.5Y 6.5/4 dry to 5/4 moist) silty clay loam; common distinct fine gray and dark brown or black iron-manganese mottles and fine soft concretions; massive but breaks to coarse vertical cleavage on slight pressure; slightly hard, dry; friable, moist; no living plant roots but old root channels common; gradual wavy lower boundary.
2831
- Cca1 60 to 70 inches. Light gray and pale yellow to light brownish gray and light yellowish brown (2.5Y 7/2 and 7/4 dry to 6/2 and 6/4 moist) silt loam; massive; slightly hard, dry; friable, moist; many very dark brown iron-manganese spots and soft concretions; calcareous, including disseminated, mycelial and fine soft concretionary lime; abrupt lower boundary.
- Cca2 70 to 78 inches. Intense very coarse mottling or marbling of gray, reddish yellow, yellowish brown and strong brown silt loam or silty clay loam; massive; soft, dry; friable, moist; many very dark brown iron-manganese soft concretions and yellowish red soft spots and pipy iron concretions.

SOIL TYPE Belfore LOCATION Cuming County, Nebraska
silty clay loam

SOIL NOS. S-55-Nebr-20-2-(1-9) LAB. NOS. 2832-2840

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1					2A2			
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2			
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-7	Alp	-	0.1	0.1	0.2	3.1	60.5	36.0	38.8	24.9	-	sic1
7-12	Al2	-	0.1	0.1	0.2	2.1	55.4	42.1	33.5	24.1	-	sic
12-17	B1	-	-	0.1	0.2	2.2	55.4	42.1	33.5	24.2	-	sic
17-24	B21	-	-	0.1	0.3	3.1	57.7	38.8	37.4	23.6	-	sic1
24-33	B22	-	-	0.1	0.3	3.7	60.8	35.1	41.6	23.1	-	sic1
33-40	B23	-	-	0.1	0.3	3.9	62.2	33.5	42.6	23.7	-	sic1
40-47	B3	-	-	0.1	0.3	5.0	63.3	31.3	45.9	22.6	-	sic1
47-54	C	-	-	0.1	0.3	5.5	63.9	30.2	46.9	22.7	-	sic1
54-60	Cca	0.1	0.1	0.1	0.3	6.7	65.9	26.8	49.5	23.3	-	sil

pH	ORGANIC MATTER					ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM @ 25°C.	6E1a		MOISTURE TENSIONS		
	6A1a		6B1a		EST% SALT (BUREAU CUP)		CoCO ₂ equiv-olent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITRO-GEN %							
5.6	5.8	6.0	2.49	.217	11.5						15.0
5.7	5.9	5.8	1.70	.147	11.6						18.1
5.8	5.9	5.8	1.14	.099	11.5						17.8
6.1	6.1	6.1	0.76	.072	10.6						16.7
5.8	6.0	6.4	0.50								15.8
6.0	6.2	6.4	0.39								15.4
6.3	6.6	6.5	0.26								15.1
6.4	6.5	6.7	0.22				1				14.8
8.0	8.2	8.4	0.18				5				14.0

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. %	4A3a Vol. Wt. g/cc	MOISTURE AT SATURATION %
	6N2b		6P2a		5B1a			
	Ca	Mg	H	Na	K			
28.9	16.9	5.9		0.1	1.6	85		
31.6	19.4	7.7		0.1	0.9	89	1.24	
31.4	19.2	7.6		0.2	0.7	88		
29.7	18.7	8.3		0.2	0.6	94		
27.9	18.0	8.3		0.1	0.5	96	1.40	
26.5	18.2	7.2		0.2	0.5	98		
25.8	18.1	7.4		0.2	0.5	100		
25.7		7.2		0.2	0.4		1.26	
24.3				0.2	0.4			

Soil type: Belfore silty clay loam

Soil No.: S55Webr-20-2-(1-9)

Location: 600 feet north and 150 feet east of southwest corner Sec. 33, T24N, R6E, Cuming County, Nebraska; 3 miles east and 5 miles north of Beamer, Nebraska, just north of Wisner-Bancroft road, about midway between the two towns.

Physiography: Nearly level plain; less than 1 percent slope to the southeast.

Use: Cultivated, corn.

Collected by: D. W. DeMoude, H. L. Kollmorgen, B. H. Williams, J. A. Elder, R. D. Greenwalt, T. F. Clapper and J. S. Allen, July 1955.

Described by: B. H. Williams.

Horizon and
Mandan

Lab. Number

- A1p 2832 0 to 7 inches. Very dark grayish brown to very dark brown (10YR 3.5/1.5 dry to 2/1.5 moist) silty clay loam; weak fine and very fine granular; soft, dry; friable, moist; abrupt smooth lower boundary.
- A12 2833 7 to 12 inches. Very dark grayish brown to very dark brown (10YR 3.5/2 dry to 2/2 moist) silty clay loam; very weak coarse prismatic and moderate medium and fine granular structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
- B1 2834 12 to 17 inches. Dark grayish brown to very dark grayish brown (10YR 4/2 dry to 2.5/2 moist) silty clay loam; weak coarse prismatic and moderate fine and very fine blocky and fine granular structure; hard, dry; firm, moist; smooth clear lower boundary.
- B21 2835 17 to 24 inches. Dark brown (10YR 4.5/3 dry to 3/3 moist) heavy silty clay loam; moderate coarse prismatic to moderate and strong fine and medium blocky structure; weak to moderate glaze on peds; hard, dry; firm, moist; plant roots common to many in this horizon and ones above; clear smooth lower boundary.
- B22 2836 24 to 33 inches. Brown to dark brown (10YR 5.5/3 dry to 3.5/2.5 moist) silty clay loam; few faint fine gray and yellowish brown mottles and very dark brown iron-manganese soft concretions; moderate coarse prismatic and moderate medium and fine blocky structure; moderate glaze on peds; hard, dry; firm, moist; plant roots few to common; clear smooth lower boundary.
- B23 2837 33 to 40 inches. Light yellowish brown to light olive brown (2.5Y 6/3 dry to 5/4 moist) silty clay loam; common medium distinct gray and yellowish brown mottles and dark brown to black iron-manganese soft concretions; moderate coarse prismatic and weak medium and fine blocky structure; moderate glaze on peds; hard, dry; firm, moist; only a few living plant roots in this horizon; clear smooth lower boundary.
- B3 2838 40 to 47 inches. Light yellowish brown to light olive brown (2.5Y 6/4 dry to 5/4 moist) silty clay loam; many fine distinct gray and yellowish brown mottles and dark brown fine iron-manganese soft concretions; weak coarse prismatic structure; little or no horizontal cleavage; weak thin discontinuous glaze on vertical prism faces; hard, dry; firm to friable, moist; no living plant roots but old root channels common to many; noncalcareous; clear smooth lower boundary.
- C 2839 47 to 54 inches. About equal amounts of 2.5Y 7/2, 7/4 and some 10YR 7/6 dry to about equal amounts of 2.5Y 6/2, 5/4 and 5/6 and some 10YR yellowish brown and dark brown, moist, coloring silty clay loam; massive; slightly hard, dry; friable, moist; many fine very dark brown iron-manganese soft concretions; old root channels and pores common; noncalcareous; clear smooth lower boundary.
- Coa 2840 54 to 60 inches. Light yellowish brown to light olive brown (2.5Y 6/3 dry to 5/4 moist) silty clay loam or heavy silt loam; common distinct fine gray and strong brown mottles and very dark brown iron-manganese streaks and soft concretions; massive; calcareous; strong effervescence; mycelial and fine soft concretionary lime and a few hard lime concretions 2 to 4 mm. in diameter; many old root channels and pores, some of which are lined with or filled with lime carbonate.

Horizons A1p, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY

Mandan, N. Dak. a/

9/22/55

SOIL TYPE Belfore
silty clay loam

LOCATION Madison County, Nebraska

SOIL NOS. S54Nebr-60-1-(1-8)

LAB. NOS. 2202-2209

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									2A2 > 2	TEXTURAL CLASS
		1B1b		3A1								
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002		
0-7	Alp	-	0.1	0.3	1.0	7.6	55.1	35.9	42.8	20.6	-	sic1
7-10	Al2	-	-	0.1	0.3	5.4	51.8	42.4	37.9	19.5	-	sic
10-21	B1	-	-	0.2	0.4	5.4	50.6	42.9	36.7	20.1	-	sic
21-32	B21	-	-	0.1	0.3	6.2	55.7	37.7	41.8	20.3	-	sic1
32-38	B22	-	0.1	0.1	0.4	6.6	58.2	34.6	44.8	20.3	-	sic1
38-44	B3	-	0.1	0.2	0.7	9.5	57.8	31.7	47.6	20.1	-	sic1
44-57	C	-	-	0.1	0.4	7.3	61.2	31.0	45.2	23.5	-	sic1
57-62	Cca	0.2	0.1	0.2	0.5	9.0	64.7	25.3	48.5	25.6	-	sil

8C1b SATURATED PASTE	pH		ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMOS PER CM	6E1a		MOISTURE TENSIONS		
	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N			CoCO ₃ equivalent %	GYP SUM me/100g SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
	5.4	6.0	6.4	1.89	.176			10.7	-	-	-	-
5.4	5.8	6.3	1.58	.149	10.6	-	-	-	-	17.0		
5.7	6.6	6.7	0.81	.081	10.0	-	-	-	-	16.9		
5.9	7.0	7.0	0.38	.047	8.1	-	-	-	-	15.6		
6.2	7.2	7.3	0.25			-	-	-	-	15.1		
6.3	7.4	7.5	0.19			-	-	-	-	14.6		
6.4	7.4	7.5	0.11			-	-	-	-	14.6		
7.4	8.3	8.5	0.12			1	-	-	-	13.0		

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	5C1	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	6E2b Ca	6O2b Mg	H	6P2a Na	6Q2a K					
	milliequivalents per 100g. soil									
25.5	14.9	6.1		0.1	1.5	89		22.6	2.4	
29.4	18.2	9.1		0.2	0.8	96		28.3	2.0	
28.7	18.6	7.6		0.1	0.5	93		26.8	2.4	
27.4	18.3	7.5		0.1	0.5	96		26.4	2.4	
26.4	18.4	7.3		0.2	0.4	100		26.3	2.5	
25.5	18.1	6.9		0.2	0.4	100		25.6	2.6	
26.0	18.9	6.6		0.3	0.6	100		26.4	2.9	
24.7		5.5		0.2	0.6					

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Belfore silty clay loam

15

Soil No.: S54Nebr-60-1-(1-8)

Location: .2 mile east and 150 feet north of southwest corner Sec. 32, T22N, R2W; about 6 miles west of Madison, Madison County, Nebraska.

Topography: 1 percent east or northeast facing slope on gently undulating plain remnant.

Use: Cultivated, corn 1954.

Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- 2202 A_{1p} 0-7" Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2.5/2, moist) silty clay loam; moderate very fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
- 2203 A₁₂ 7-10" Very dark grayish brown (10YR 3/2.5, dry) to very dark brown (10YR 2/2.5, moist) silty clay loam; strong fine granular structure; soft, dry; very friable, moist; clear smooth lower boundary.
- 2204 B₁ 10-21" Dark brown (10YR 4/3, dry) to dark brown (10YR 3/3, moist) heavy silty clay loam; compound weak coarse prismatic, moderate coarse subangular blocky and strong very fine subangular blocky or fine and medium granular structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
- 2205 B₂₁ 21-32" Brown (10YR 5/3, dry) to brown (10YR 4/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and strong coarse and medium blocky structure with moderate glaze on blocks and some very dark brown staining along vertical cleavage planes; hard, dry; firm, moist; gradual smooth lower boundary.
- 2206 B₂₂ 32-38" Brown (10YR 5/3, dry) to dark brown (10YR 4/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and strong coarse blocky structure with moderate glaze on blocks and some very dark brown staining along vertical cracks; hard, dry; firm, moist; gradual wavy lower boundary.
- 2207 B₃ 38-44" Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 4.5/4, moist) silty clay loam; a few faint fine gray and brown mottles; moderate coarse blocky structure; hard, dry; friable, moist; gradual wavy lower boundary.
- 2208 C 44-57" Pale yellow (2.5Y 7/4, dry) to yellowish brown (10YR 5/4, moist) heavy silt loam; few prominent gray brownish yellow and strong brown mottles and a few very dark brown iron-manganese spots; massive, but with some tendency to weak coarse subangular blocky structure; slightly hard, dry; friable, moist; numerous pores and fine, thread-like channels; no roots apparent; gradual wavy lower boundary.
- 2209 C_{ca} 57-62" Pale yellow (2.5Y 7/4, dry) to light yellowish brown (10YR 5.5/4, moist) silt loam; mottles about as in horizon above; massive; soft, dry; very friable, moist; calcareous, but effervesces only on lime spots and concretions in the upper part; moderate to strong effervescence throughout in the lower part.

SOIL TYPE Belfore LOCATION Platte County, Nebraska
 silty clay loam

SOIL NOS. S54Nebr-71-1-(1-8) LAB. NOS. 2194-2201

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1b		3A1					2A2			
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	> 2			
0-7	Alp	-	0.1	0.3	0.9	5.9	58.1	34.7	42.3	22.2	-	sic1
7-10	A3	-	-	0.1	0.2	5.2	53.9	40.6	38.1	21.1	-	sic
10-17	B1	-	-	0.1	0.4	5.0	51.3	43.2	35.1	21.4	-	sic
17-30	B21	-	-	0.1	0.2	4.8	54.5	40.4	37.8	21.6	-	sic
30-37	B22	-	-	0.1	0.3	5.3	57.9	36.4	42.6	20.8	-	sic1
37-45	B23	-	-	0.1	0.5	6.6	57.8	35.0	42.6	22.1	-	sic1
45-54	B3	-	0.1	0.2	0.7	8.1	57.9	33.0	44.8	21.7	-	sic1
54-60	C	-	-	0.1	0.4	7.6	60.4	31.5	44.6	23.6	-	sic1

801b SATURATED PASTE	pH 801a	801a	ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC-103 MILLIMHOS PER CM	6E1a CoCO ₃ equiv- alent	GYPSUM me./100g SOIL	MOISTURE TENSIONS		
			6A1a ORGANIC CARBON	6B1a NITRO- GEN	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
			%	%								
5.5	6.0	6.2	2.26	.218	10.4	-	-	-	-	-	13.8	
5.2	6.0	6.0	1.89	.175	10.8	-	-	-	-	-	16.8	
5.3	6.0	6.0	1.32	.125	10.6	-	-	-	-	-	17.6	
5.7	6.5	6.5	0.66	.068	9.7	-	-	-	-	-	16.4	
5.8	6.5	6.9	0.36			-	-	-	-	-	15.5	
6.0	6.8	6.8	0.23			-	-	-	-	-	15.5	
6.1	6.8	7.2	0.16			-	-	-	-	-	14.9	
6.2	6.7	7.3	0.15			-	-	-	-	-	14.3	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	5A3a Sum Cations	8D3 Ca/Mg	MOISTURE AT SATU- RATION %
	6N2b		6P2a						
	Ca	Mg	H	Na	K				
	milliequivalents per 100g. soil					5C1	me/100g		
25.7	14.4	5.0		0.1	1.9	83	21.4	2.9	
28.0	17.0	6.2		0.1	0.9	86	24.2	2.7	
28.5	17.7	7.0		0.1	0.7	89	25.5	2.5	
28.4	17.6	7.6		0.2	0.7	92	26.1	2.3	
26.9	18.1	7.3		0.2	0.7	98	26.3	2.5	
26.5	18.7	7.5		0.3	0.7	100	27.2	2.5	
26.3	18.7	7.3		0.3	0.7	100	27.0	2.6	
25.8	18.6	6.9		0.3	0.6	100	26.4	2.7	

a// Particle size analyses by Beltsville Laboratory.

Soil type: Belfore silty clay loam

Soil No.: S54Nebr-71-1-(1-8)

Location: 100 feet east and 100 feet south of north quarter corner, Sec. 31, T20N, R2W; Platte County, Nebraska.

Topography: About 1 percent south facing slope--broad undulating and gently sloping plain.

Use: Cultivated, corn 1954; rotation with small grain and red clover in alternate years except alfalfa for a period of 3 or 4 years out of each 15. Corn yields about 60 bushels maximum, as low as 8 or 10 bushels in 1930 drought years. In cultivation about 60 years. No amendments used on land.

Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|-----------------|--------|--|
| 2194 | A _{1p} | 0-7" | Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 2.5/2, moist) silty clay loam; weak fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary. |
| 2195 | A ₃ | 7-10" | Very dark grayish brown (10YR 3/2, dry) to very dark brown (10YR 2/2, moist) silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary. |
| 2196 | B ₁ | 10-17" | Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) heavy silty clay loam; compound weak coarse prismatic separating to weak medium subangular blocky and moderate very fine blocky; slightly hard, dry; friable, moist; dark crack filling from horizon above; clear smooth lower boundary. |
| 2197 | B ₂₁ | 17-30" | Brown (10YR 4.5/3, dry) to dark brown (10YR 3/3, moist) silty clay; compound weak coarse prismatic and strong fine and medium blocky structure, with moderate glaze on faces of blocks and some dark infiltration along vertical cracks; hard, dry; firm, moist; clear smooth lower boundary. |
| 2198 | B ₂₂ | 30-37" | Brown (10YR 5.5/3, dry) to dark grayish brown (10YR 4.5/2, moist) heavy silty clay loam; compound weak coarse prismatic and moderate to strong fine and medium blocky structure; hard, dry; firm, moist; gradual smooth lower boundary. |
| 2199 | B ₂₃ | 37-45" | Pale brown (10YR 6/3, dry) to brown (10YR 5/3, moist) silty clay loam; common faint fine gray and strong brown mottles; moderate medium and coarse blocky structure; hard, dry; friable, moist; weak glaze on peds; numerous very fine thread-like tubes and channels; gradual smooth lower boundary. |
| 2200 | B ₃ | 45-54" | Light yellowish brown (10YR 6/4, dry) to brown (10YR 5/3, moist) silty clay loam; common faint gray and strong brown mottles and a few very dark brown iron-manganese spots; moderate to weak coarse blocky structure, with more pronounced vertical than horizontal cleavage; slightly hard, dry; friable moist; numerous thread-like channels and a few fine roots and root channels up to 1 mm. in diameter; gradual smooth lower boundary. |
| 2201 | C | 54-60" | Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 5/4, moist) heavy silt loam; common distinct fine gray and strong brown mottles; massive, except a few vertical cracks or cleavage planes; slightly hard, dry; friable, moist. Numerous thread-like pores and root channels and a few fine roots. No free lime carbonate to a depth of 7 1/4 inches. |

SOIL TYPE Bridgeport LOCATION Dundy County, Nebraska

SOIL NOS. 57/Nebr-29-1 LAB. NOS. 6814-6820

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1M1a										
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	3A1		2A2	
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	> 2			
0-5	Ap	0.1	0.2a	0.2a	1.8a	43.8a	42.5	11.4	80.7	7.0	-	1
5-11	AC	0.1	0.1a	0.1a	1.3a	41.2a	45.3	11.9	79.5	8.1	-	1
11-23	C1	0.1	0.1a	0.1a	1.6a	47.2a	40.8	10.1	83.7	5.7	-	1
23-35	C2	-	-	0.1a	0.8a	35.1a	54.8	9.2	79.7	10.8	-	silt
35-47	A11b	-	0.1a	0.3a	2.5a	44.5a	39.8	12.8	80.0	6.4	-	1
47-56	A12b	-	0.1a	0.3a	2.6a	45.4a	38.3	13.3	79.5	6.4	-	1
56-66	A13b	-	0.2a	0.4a	3.1a	45.8a	37.1	13.4	79.3	6.1	-	1

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6M1a	4A3a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6M1a	C/N	EST. SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CoCO ₃ equiv- alent	Vol. Wt. g/cc	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:1	1:10	ORGANIC CARBON %	NITRO-GEN %			8A1a	%		%	%	%
7.7	8.2	8.8	0.64	0.066	10	< 0.20	0.8	3				7.1
7.7	8.2	8.8	0.37	0.044	8	< 0.20	0.5	3	1.43			7.4
7.7	8.3	8.9	0.14	0.019		< 0.20	0.5	5				6.2
7.7	8.2	8.8	0.19	0.025		< 0.20	0.4	4	1.36			7.7
7.7	8.0	8.7	0.50	0.050	10	< 0.20	0.4	2				7.4
7.8	8.1	8.8	0.41	0.043	10	< 0.20	0.5	3				7.8
7.8	8.1	8.8	0.32	0.035	9	< 0.20	0.4	3				7.8

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5M1a					5B2	8A1 SATURATION EXTRACT SOLUBLE		8A
	milliequivalents per 100g. soil					EXCH. No %	6P1a	6Q1a	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K		No	K	
14.4					2.2	-	0.3	1.8	43.1
14.8					1.4	-	0.2	0.7	40.9
12.8					1.0	-	0.3	0.5	40.5
15.3				0.1	1.2	1	0.3	0.4	43.2
15.0				0.1	1.0	1	0.4	0.4	44.6
14.2				0.1	1.2	1	0.4	0.5	45.5
13.7				0.1	1.3	1	0.5	0.6	45.7

a. Few CaCO₃ concr. Also few smooth black concr.

Soil type: Bridgeport very fine sandy loam

Soil No.: S57Nebr-29-1-(1-7)

Location: .25 mile north and .1 mile east of southwest corner Sec. 36, T2N, R37W, about 120 feet north of Highway 34 and 540 feet east of culvert; approximately 3 miles southwest of Max, Dundy County, Nebraska.

Topography: On a 2 percent smooth south facing colluvial-alluvial fan slope.

Land use: Alfalfa 1957.

Described by: Ross Greenawalt.

Horizon and

Lincoln

Lab. Number

- Ap
6814 0 to 5 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak medium and coarse angular blocky structure (cloddy); soft, dry; very friable, moist; strong effervescence; gradual smooth lower boundary.
- AC
6815 5 to 11 inches. Light brownish gray or pale brown (10YR 6/2.5 dry) to grayish brown (10YR 5/2 moist) very fine sandy loam; weak coarse angular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
- C1
6816 11 to 23 inches. Very pale brown or pale brown (10YR 6.5/3 dry) to brown (10YR 5/3 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
- C2
6817 23 to 35 inches. Very pale brown (10YR 7/3 dry) to pale brown or brown (10YR 5.5/3 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
- Allb
6818 35 to 47 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown or very dark grayish brown (10YR 3.5/2 moist) very fine sandy loam; weak fine and very fine granular structure; soft, dry; very friable, moist; noncalcareous; gradual smooth lower boundary.
- Al2b
6819 47 to 56 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak coarse subangular blocky structure breaking into weak very fine granules; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
- Al3b
6820 56 to 66 inches. Pale brown (10YR 6/3 dry) to grayish brown or brown (10YR 5/2.5 moist) very fine sandy loam; weak coarse subangular blocky structure breaking into weak very fine granules; soft, dry; very friable, moist; violent effervescence.

Remarks: The lime occurring in this profile is disseminated. Few krotovinas approximately 2 inches in diameter occur throughout the profile which have been caused by rodent working and mixing. There is some question if coarse angular and subangular blocky structure in the C horizons and the Alb horizons is genetic soil structure. The structure may be due to soil fracture rather than to true structure planes. Source of parent material is a 3- to 4-square mile drainage area consisting of steep thin silty soils with Tertiary outcrops on the lower slopes. (A side drainage to the Republican River Valley.) Horizons Ap, C1 and Allb were sampled for Bureau of Public Roads.

SOIL TYPE Bridgeport

LOCATION Dundy County, Nebraska

silt loam

SOIL NOS. S57Nebr-29-2

LAB. NOS. 6821-6827

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			> 2		
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002					
0-5	Ap	0.1	0.2a	0.2a	1.3a	29.7a	53.1	15.4	70.3	13.5	-	s11	
5-9	AC	0.1	0.1a	0.2a	1.2a	28.3a	52.3	17.8	67.8	13.8	-	s11	
9-13	Cl	-	-	0.1a	1.6a	37.9a	45.0	15.4	73.9	10.4	-	1	
13-21	Ab1	-	-	0.2a	1.1a	36.9a	46.2	15.6	73.8	10.2	-	1	
21-34	Cb1	0.1	-	0.2a	2.5a	36.2a	47.5	13.5	76.6	9.1	-	1	
34-42	Ab2	-	0.2a	0.7a	2.3a	36.2a	48.0	12.6	76.9	8.8	-	1	
42-60	Cb2	-	0.4a	2.3a	5.0a	46.6a	34.8	10.9	79.5	4.9	-	vs1	

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	4A3a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM @25°C	CaCO ₃ equivalent	Vol. Wt.	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:1	1:10	ORGANIC CARBON %	NITROGEN %				%	g/cc	%	%	%
7.7	8.0	8.7	0.60	0.065	9	<0.20	1.3	3				9.4
7.7	7.9	8.7	0.58	0.062	9	<0.20	0.5	4	1.46			10.5
7.7	7.9	8.8	0.28	0.034	8	<0.20	0.5	4				8.8
7.7	8.0	8.7	0.41	0.045	9	<0.20	0.5	3				8.9
7.7	7.9	8.7	0.27	0.030	9	<0.20	0.8	4	1.36			8.1
7.6	7.8	8.6	0.53	0.053	10	<0.20	1.2	3				7.9
7.7	7.9	8.8	0.21	0.024		<0.20	1.2	3				6.1

5A1a CATION EXCHANGE CAPACITY NH ₄ AC	EXTRACTABLE CATIONS					5B2	SATURATION EXTRACT SOLUBLE		8A
	Ca	Mg	H	Na	K	EXCH. No %	6F1a	6G1a	MOISTURE AT SATURATION
	milliequivalents per 100g. soil						milliequivalents per liter		%
18.6				2.2	-	-	0.4	1.5	44.1
19.4				1.9	-	-	0.2	0.8	45.0
17.2				1.4	-	-	0.3	0.6	42.0
17.3			0.1	1.2	-	-	0.3	0.4	48.3
15.0			0.1	1.1	1	1	0.6	0.5	44.2
15.6			0.2	1.2	1	1	1.3	0.8	44.9
12.4			0.2	1.1	2	2	1.5	0.8	39.0

a. Few CaCO₃ concn. Also few smooth black concn.

Soil type: Bridgeport silt loam

Soil No.: S57Nebr-29-2-(1-7)

Location: 2300 feet east and 45 feet north of southwest corner Sec. 30, T2N, R36W; approximately 1½ miles southwest of Max, Dundy County, Nebraska, on U.S. Highway 34.

Topography: On a 1 percent convex south-southwest facing colluvial-alluvial fan slope.

Land use: Corn 1957.

Described by: Ross Greenawalt.

Horizon and
Lincoln
Lab. Number

- Ap
6821 0 to 5 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak very fine granular structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
- AC
6822 5 to 9 inches. Pale brown (10YR 6/3 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) silt loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
- Cl
6823 9 to 13 inches. Brown or yellowish brown (10YR 5/3.5 dry) to dark brown or dark yellowish brown (10YR 4/3.5 moist) silt loam; weak coarse subangular blocky structure breaking into weak fine granules; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
- Ab1
6824 13 to 21 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak fine and very fine granular structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
- Cb1
6825 21 to 34 inches. Very pale brown or pale brown (10YR 6.5/3 dry) to grayish brown or brown (10YR 5/2.5 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; abrupt smooth lower boundary.
- Ab2
6826 34 to 42 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown or very dark grayish brown (10YR 3.5/2 moist) very fine sandy loam; weak fine and very fine granular structure; soft, dry; very friable, moist; violent effervescence; clear smooth lower boundary.
- Cb2
6827 42 to 60 inches. Pale brown (10YR 6/3 dry) to grayish brown (10YR 5/2 moist) light very fine sandy loam; weak coarse subangular structure; soft, dry; very friable, moist; violent effervescence.

Remarks: The lime occurring in this profile is disseminated. Few krotovinas approximately 2 inches in diameter occur throughout the profile which have been caused by rodent working and mixing. There is some question if the coarse subangular blocky structure in the AC, Cl, Cb1, and Cb2 horizons is genetic soil structure. The structure may be due to soil fracture rather than true structure planes. Source of parent material is a 3- to 4-square mile drainage area consisting of steep and thin silty soils with Tertiary outcrops on the lower slopes. (A side drainage to the Republican River Valley.) Horizons Ap, Ab1, and Ab2 sampled for Bureau of Public Roads.

SOIL TYPE Bridgeport

LOCATION Dundy County, Nebraska

SOIL NOS.

857Nebr-29-4

LAB. NOS. 6833-6837

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1R1a		3A1						2A2			
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			> 2		
		2.1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002			
0-7	Ap	0.2a	2.4b	4.8b	12.3b	33.2b	33.5	13.6	65.0	8.2	-	vs1/1	
7-19	AC	-	0.5b	1.0b	4.0b	26.2b	48.1	20.2	58.4	18.4	-	1	
19-34	C1	-	0.2b	0.2b	2.1b	22.9b	55.0	19.6	60.3	19.3	-	s11	
34-48	C2	-	0.1b	0.2b	2.5b	37.8b	44.8	14.6	73.7	10.9	-	1	
48-60	C3	-	0.1b	0.7b	3.0b	25.6b	54.0	16.6	65.1	16.4	-	s11	
		pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	4A3a	MOISTURE TENSIONS		
		8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMOS PER CM 6A1a	CaCO ₃ equivalent	Vol. Wt. g/cc	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
		1:1	1:10	ORGANIC CARBON %	NITROGEN %	C/N			%		%	%	%
7.7	8.3	8.9	0.60	0.066	9	<0.20	0.6	1					6.9
7.6	8.2	8.9	0.41	0.046	9	<0.20	0.5	6	1.44				9.3
7.7	8.2	8.9	0.25	0.034		<0.20	0.5	6	1.28				9.2
7.8	8.4	9.0	0.20	0.024		<0.20	0.5	8					7.4
8.0	8.8	9.4	0.21	0.027		<0.20	1.0	5					8.4
5A1a		EXTRACTABLE CATIONS				5B1a	5D2	SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY NH ₄ Ac		Ca	Mg	H	Na	K	EXCH. No %	6P1a	6Q1a				MOISTURE AT SATURATION
		milliequivalents per 100g. soil						milliequivalents per liter					%
12.4					-	1.4	-	0.4	1.1				36.7
16.0					-	0.8	-	0.3	0.8				43.0
15.7					0.1	1.1	1	0.6	0.5				44.9
13.4					0.4	0.8	2	2.1	0.3				40.2
15.0					2.2	0.7	13	6.5	0.2				40.6
a. Some organic matter													
b. Few CaCO ₃ concn.													

Soil type: Bridgeport very fine sandy loam

Soil No.: 857Nebr-29-4-(1-5)

Location: 2555 feet west of northeast corner Sec. 33, T1N, R41W, approximately 85 feet east of north quarter corner, .75 mile west of Haigler, Dundy County, Nebraska, on curve of U.S. Highway 34, about .1 mile beyond highway intersection with Sullivan Draw, then west 175 feet.

Topography: On a smooth 0-1 percent northeast facing high bottom or low terrace position along the Arikaree and Republican Rivers.

Land use: Sorghum 1957.

Described by: Ross Greenawalt.

Horizon and

Lincoln

Lab. Number

Ap 6833	0 to 7 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; weak fine and very fine granular structure; soft, dry; very friable, moist; slight effervescence; abrupt smooth lower boundary.
AC 6834	7 to 19 inches. Pale brown (10YR 6/3 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) silt loam; weak coarse subangular blocky structure breaking into weak fine and medium granules; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C1 6835	19 to 34 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C2 6836	34 to 48 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) light very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence; gradual smooth lower boundary.
C3 6837	48 to 60 inches. Pale brown (10YR 6/3 dry) to grayish brown (10YR 5/2 moist), very fine sandy loam; weak coarse subangular blocky structure; soft, dry; very friable, moist; violent effervescence.

Remarks: The lime in this profile occurs as disseminated lime. Few krotovinas approximately 2 inches in diameter occur throughout the profile which have been caused by rodents. There is some question if the weak coarse subangular blocky structure in the C1, C2 and C3 horizons is genetic soil structure. The structure may be due to soil fracture rather than to true structure planes. This soil is developing in material that has been deposited by a rather large drainage (Sullivan Draw). The present channel of this drainage is slightly lower than the surrounding land where this soil is located. This position is also slightly higher than the first bottom lands of the Republican and Arikaree Valleys. The drainage area of Sullivan Draw consists of steep light-colored loessal soils with Tertiary outcrops on some slopes. Horizons Ap, C1 and C3 sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. February 1959

SOIL TYPE Burchard LOCATION Saunders County, Nebraska,
clay loam

SOIL NOS. S58Nebr-78-1-(1-8) LAB. NOS. 8414-8421

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2 > 2 ($\leq 19\mu$)
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002			
0-6	Alp	2.1	4.4	6.4	14.3	10.4	36.7	25.7	41.3	12.8	2	cl	
6-9	Al2	3.7	5.8	5.4	11.0	7.6	30.8	35.7	30.4	13.4	4	cl	
9-13	B21	2.4	5.4	5.6	11.1	7.0	29.9	38.6	28.1	14.2	Tr.	cl	
13-20	B22	1.3	4.7	5.4	11.1	8.1	31.1	38.3	29.1	15.6	Tr.	cl	
20-24	B3ca	2.6a	4.5a	4.6a	10.2a	8.2a	38.3	31.6	29.8	22.0	Tr.	cl	
24-36	C1	2.4a	4.2a	4.5a	10.4a	8.0a	37.3	33.2	29.1	21.5	7	cl	
36-48	C2	2.4a	4.4a	4.7a	10.7a	8.1a	37.2	32.5	27.8	23.0	6	cl	
48-60	C3	1.7a	4.3a	4.9a	10.8a	8.3a	36.5	33.5	29.3	21.0	Tr.	cl	
pH		ORGANIC MATTER				ELECTRICAL CONDUCTIVITY EC-103 MILLIMHOS PER CM 5A1a	6E1a		MOISTURE TENSIONS				
8C1a	1:5	1:10	6A1a ORGANIC CARBON	7B1a NITROGEN	C/N		CaCO ₃ equiv-alem	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	4B2	
1:1			%	%		%		%	%	%	%		
5.7			2.02	0.174	11.6	0.4					11.7		
5.7			1.64	0.139	11.8	0.4					15.5		
6.0			1.10	0.089	12.4	0.4					16.0		
6.7			0.60	0.057	10	0.5	< 1				15.5		
8.0			0.43	0.040	11	0.5	15				12.9		
8.1			0.20			0.5	12				13.9		
8.1			0.05			0.5	14				14.7		
8.0			0.03			0.5	11				15.5		
5A1a	EXTRACTABLE CATIONS 5B1a					BASE SAT. % NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a Sum Bases	5A3a Sum Cat-ions	8D3 Ca/Mg	8A MOISTURE AT SATURATION %		
	6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K								
	milliequivalents per 100g. soil					5C1	5C3	< me/100 g >					
20.7	14.8	3.6	7.3	<0.1	0.5	91	72	18.9	26.2	4.1	48.8		
26.0	20.0	3.9	6.6	<0.1	0.4	93	79	24.3	30.9	5.1	59.5		
28.6	23.6	3.5	5.4	0.1	0.4	96	84	27.6	33.0	6.7	60.0		
27.7	26.0	3.0	4.6	0.1	0.4	106	86	29.5	34.1	8.7	63.5		
20.8			<0.1	0.1	0.3						55.6		
20.0			<0.1	0.1	0.3						57.3		
19.8			<0.1	0.1	0.3						59.1		
18.4			<0.1	0.2	0.4						61.7		

a. Common CaCO₃ concn.

Soil type: Burchard clay loam
 Soil No.: S58Nebr-78-1-(1-8)
 Location: 1100 feet south and 30 feet west of northeast corner Sec. 30, T13N, R6E; approximately 3 miles east and 1/2 mile south of Valparaiso, Saunders County, Nebraska.

Physiography: Dissected till plain.

Relief: 40 to 60 feet.

Slope: 12 percent west facing slope.

Parent material: Glacial till.

Erosion: Moderate.

Drainage: Excessive.

Permeability: Moderately slow.

Land use: Alfalfa 1958.

Described by: W. E. McKinzie and J. A. Elder.

Horizon and

Lincoln

Lab. Number

- A1p 0 to 6 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) light clay loam; weak fine granular; friable moist; no effervescence; abrupt smooth boundary.
- 8414
- A12 6 to 9 inches. Black (10YR 2/1 moist) to very dark grayish brown (10YR 3/2 dry) light clay loam; weak coarse subangular blocky to moderate medium granular; friable moist; no effervescence; abrupt smooth boundary.
- 8415
- E21 9 to 13 inches. Dark brown (10YR 3/3 moist) to dark grayish brown (10YR 4/2 dry) clay loam; weak coarse prismatic to moderate fine and medium subangular blocks; slightly hard, dry; friable, moist; no effervescence; thin discontinuous clay skins on aggregates; clear smooth boundary.
- 8416
- E22 13 to 20 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) heavy clay loam; weak coarse prismatic to strong fine and medium subangular blocks; hard, dry; firm, moist; no effervescence; thin continuous clay skins on aggregates; few small iron stains; abrupt smooth boundary.
- 8417
- E3ca 20 to 24 inches. Dark brown (10YR 4/3 moist) to pale brown (10YR 6/3 dry) clay loam; weak coarse prismatic to moderate medium subangular blocky; hard, dry; firm, moist; violent effervescence; few pockets of disseminated lime; thin discontinuous clay skins on aggregates; clear smooth boundary.
- 8413
- C1 24 to 36 inches. Dark grayish brown (2.5Y 4/2 moist) to grayish brown (2.5Y 5/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; violent effervescence; many fine distinct yellowish brown and dark brown mottles and small pockets and channels of soft white lime; gradual smooth boundary.
- 8419
- C2 36 to 48 inches. Approximately 50 percent dark grayish brown (2.5Y 4/2 moist) to light grayish brown (2.5Y 6/2 dry) and 50 percent dark yellowish brown (10YR 4/4 moist) to yellowish brown (10YR 5/4 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; violent effervescence; mottled with many fine distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; horizon streaked with reddish brown iron stains; gradual smooth boundary.
- 8420
- C3 48 to 60 inches. Approximately 50 percent dark grayish brown (2.5Y 4/2 moist) to light grayish brown (2.5Y 6/2 dry) and 50 percent dark yellowish brown (10YR 4/4 moist) to yellowish brown (10YR 5/4 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; violent effervescence; mottled with many fine distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; horizon streaked with reddish brown iron stains.
- 8421

Note: Medium and coarse gravels scattered throughout profile.

SOIL SURVEY LABORATORY Lincoln, Nebr. February 1959

SOIL TYPE Burchard LOCATION Saunders County, Nebraska
 clay loam

SOIL NOS. S58Nebr-78-5-(1-8) LAB. NOS. 8449-8456

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	> 2 (< 9mm)	
2.1	1.0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-6	Alp	1.4a	2.6a	3.0a	6.9a	6.3a	43.3	36.5	36.4	16.7	Tr.	cl
6-8	Al2	0.9a	2.8a	3.2a	7.5a	6.2a	40.6	38.8	34.8	15.9	Tr.	cl
8-12	B21	1.6a	3.6a	3.7a	8.9a	7.0a	34.2	41.0	29.8	16.1	Tr.	c
12-19	B22	1.4a	4.0a	4.3a	9.6a	7.7a	33.8	39.2	30.4	16.1	Tr.	cl
19-26	B3ca	1.8a	4.5a	4.7a	10.4a	8.3a	35.9	34.4	31.3	18.3	2	cl
26-36	C1	2.2a	4.2a	4.5a	10.3a	8.1a	36.8	33.9	30.0	20.3	2	cl
36-46	C2	2.6a	4.5a	4.6a	10.2a	8.2a	38.3	31.6	29.8	22.0	6	cl
46-60	C3	2.3b	4.6b	4.6b	11.1b	9.0b	35.3	33.1	30.4	19.5	5	cl

pH		ORGANIC MATTER			ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a		MOISTURE TENSIONS		
1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N		CaCO ₃ equiv-alent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.
5.8		1.56	0.142	11.0	0.3					14.8
5.8		1.39	0.120	11.6	0.4					15.8
5.2		0.74	0.064	12	0.5					16.7
6.4		0.47	0.041	11	0.5					15.8
8.0		0.25	0.024	10	0.7	9				13.6
8.1		0.12			0.5	12				13.8
8.1		0.06			0.5	14				13.8
8.1		0.04			0.5	10				14.8

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. % NH ₄ Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	5B1a Sum Bases <me/100 g>	5A3a Sum Cations	8D3 Ca/Mg	8A MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6H1a H	6P2a No	6Q2a K						
27.8	18.6	5.8	7.4	<0.1	0.5	90	77	24.9	32.3	3.2	57.5
29.0	21.1	5.9	6.6	0.1	0.4	95	81	27.5	34.1	3.6	59.9
30.3	24.1	5.0	4.6	0.1	0.4	98	86	29.6	34.2	4.8	64.2
29.0	24.5	4.2	2.9	<0.1	0.4	100	91	29.1	32.0	5.8	67.5
22.6			<0.1	0.1	0.3						63.8
21.4			<0.1	0.1	0.3						65.6
19.5			<0.1	0.1	0.3						68.0
19.9			<0.1	0.1	0.3						76.0

a. Trace smooth black to brown concr. (Fe-Mn?)
 b. Few, CaCO₃ concr.

Soil type: Burchard clay loam
 Soil No.: S58Nebr-78-5-(1-8)
 Location: 160 feet north and 140 feet east of west quarter corner Sec. 20, T13N, R5E (approximately 40 feet north of small gully); 2½ miles west of Valparaiso, Saunders County, Nebraska.
 Physiography: Dissected till plain.
 Relief: 40 to 60 feet.
 Slope: 12 percent west facing slope.
 Parent material: Glacial till.
 Erosion: Moderate.
 Drainage: Excessive.
 Permeability: Moderately slow.
 Land use: Corn 1958.

Described by: W. E. McKinzie and J. A. Elder.

Horizon and
 Lincoln
 Lab. Number

A1p 0 to 6 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) light clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
 8449

A12 6 to 8 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) clay loam; weak coarse subangular blocky; friable, moist; no effervescence; lighter-colored material from B horizon present is result of rodents; abrupt smooth lower boundary.
 8450

B21 8 to 12 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam; weak coarse prismatic to moderate fine subangular blocky; slightly hard, dry; firm, moist; no effervescence; thin continuous clay skins on aggregates; clear smooth boundary.
 8451

B22 12 to 19 inches. Dark grayish brown (10YR 4/2 moist) to grayish brown (10YR 5/2 dry) heavy clay loam; weak coarse prismatic to strong fine and medium blocky; slightly hard, dry; firm, moist; no effervescence; thin continuous clay skins on aggregates; abrupt smooth boundary.
 8452

B3ca 19 to 26 inches. Dark grayish brown (2.5Y 4/2.5 moist) to grayish brown (2.5Y 5/2 dry) heavy clay loam; weak coarse prismatic to moderate fine and medium blocky; hard, dry; firm, moist; violent effervescence; thin discontinuous clay skins on aggregates; few fine faint yellowish brown and dark brown mottles; small pockets of soft white lime; clear smooth boundary.
 8453

C1 26 to 36 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; many medium distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; iron and manganese concretions present; gradual smooth boundary.
 8454

C2 36 to 46 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; many medium distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; iron and manganese concretions present; gradual smooth boundary.
 8455

C3 46 to 60 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) silty clay (slightly weathered till); strong medium and coarse blocky; very hard, dry; very firm, moist; many medium distinct yellowish brown and dark brown mottles; many pockets and channels of soft white lime; iron and manganese concretions present.
 8456

Note: Few small and medium gravels scattered throughout profile.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Canyon LOCATION Kimball County, Nebraska
loam, eroded

SOIL NOS. S57Nebr-53-8-(1-4) LAB. NOS. 5842-5845

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1 0.2-0.02	0.02-0.002	2A2 > 2 < 19mm	
0-6	Alp	7.8a	15.1a	12.0a	14.1a	12.5a	21.3	17.2	34.6	6.8	5	sl
6-11	AC	8.6a	12.5a	9.4a	10.5a	10.0a	22.8	26.2	28.1	10.2	9	scl
11-18	C1	6.5a	11.0a	7.9a	9.7a	10.1a	25.9	28.9	28.3	13.2	8	scl
18-24	Dr	13.7b	10.0b	5.2b	7.2b	9.4b	29.2	25.3	28.2	14.5	3c	1

8C1b Saturated Paste	pH		ORGANIC MATTER			8A2 ESTS SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC x 10 ³ MICROMMHOS PER CM @ 25°C	6E1a CaCO ₃ equiv- alent %	GYPSUM mg./100g. SOIL	MOISTURE TENSIONS			4B2 W ATMOS. %
	8C1a 1:1	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO- GEN %	C/N					1/10 ATMOS. %	1/3 ATMOS. %	4B2 W ATMOS. %	
7.5	8.0	8.5	1.27	.130	9.8	<0.20	0.7	11				9.5	
7.6	8.0	8.8	0.78	.096	8.1	<0.20	0.6	22				13.0	
7.7	8.1	8.9	0.45	.051	8.8	<0.20	0.6	40				13.0	
7.7	8.2	9.0	0.22	.030		<0.20	0.6	45				10.3	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5D2 EXCH. No %	SATURATION EXTRACT SOL.		Vol Wt. g/cc	8A MOISTURE AT SATU- RATION %
	Ca	Mg	H	Na	K		6F1a Na	6Q1a K		
15.1				-	1.0	-	0.2	0.7		37.5
13.2				-	0.4	-	0.2	0.2		47.9
10.6				-	0.3	-	0.3	0.2		44.6
10.9				-	0.4	-	0.4	0.2		37.8

a. Common CaCO₃ coner.
b. Many CaCO₃ coner.

Soil type: Canyon loam, eroded

Location: Kimball County, Nebraska. 0.3 mile west of SE corner and 250 feet north (along oil well road) Sec. 3, T13N, R55W. About 8 miles south and 3 miles east of Kimball, Nebraska.

Topography: About a 4 percent ridge top in weathered Tertiary sands and silts on the dissected Tertiary plains.

Cultivation: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-8-(1-4)

Lincoln

Lab.No.	Horizon	
5842	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak fine granular; very friable, moist; strong effervescence; abrupt smooth lower boundary.
5843	AC	6-11 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; gradual smooth lower boundary.
5844	Cl	11-18 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) loam; massive structure; very friable, moist; violent effervescence; abrupt wavy lower boundary.
5845	Dr	18-24 inches. Weathered Tertiary consisting of large amount of limestone fragments with a loamy sand to sandy loam (10YR 7/3 moist) matrix. This horizon appears to have been reworked by rodents as materials from Cl and AC horizons were mixed through it.

Note: Horizons Al and Cl were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Canyon LOCATION Kimball County, Nebraska
loam, eroded

SOIL NOS. S57Nebr-53-9-(1-4) LAB. NOS. 5846-5849

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02		0.02-0.002 (< 9mm)		> 2
0-4	Alp	7.8a	11.4a	9.7a	16.7a	19.1a	22.3	13.0	46.0	5.0	4	sl	
4-9	AC	6.4a	9.0a	8.1a	14.3a	16.8a	23.8	21.6	38.8	10.4	3	scl	
9-16	C	8.5a	8.6a	6.6a	11.0a	13.7a	27.8	23.8	32.3	15.7	2	scl	
16-22	Dr	27.5b	11.3b	6.2b	10.9b	13.5b	21.1	9.5	28.3	12.9	10	cosl	

8C1b Saturated Paste	pH		ORGANIC MATTER			8A2 ESTS SALT (BUREAU CLP)	ELECTRI- CAL CONDUCTI- VITY EC x 10 ³ MILLIMHS PER CM 8A1a	6E1a CaCO ₃ equiv- alent %	MOISTURE TENSIONS			4B2 15 ATMOS. %
	8C1a 1:1	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO- GEN %	C/N				6E1a 1/10 ATMOS. %	6E1a 1/3 ATMOS. %	6E1a 15 ATMOS. %	
	7.6	8.0	8.5	1.60	.145				21.0	<0.20	0.7	
7.5	7.9	8.6	1.75	.138	9.3	<0.20	0.7	19			12.5	
7.5	8.0	8.7	1.05	.133	7.9	<0.20	0.6	27			14.4	
7.6	8.1	8.9	0.39	.050	7.8	<0.20	0.6	35			7.8	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					5D2 EXCH. No %	5A1 SATURATION EXTRACT SOL.		Vol Wt. E/cc	8A MOISTURE AT SATU- RATION %
	Ca	Mg	N	Na	K		6P1a No	6Q1a K		
	milliequivalents per 100g. soil						milliequivalents per liter			
15.1					1.2	-	0.2	0.9		39.2
15.8					0.5	-	0.3	0.3		48.9
14.1					0.3	-	0.3	0.2		52.3
11.4					0.6	-	0.3	0.2		38.5

a. Common CaCO₃ coner.
b. Many CaCO₃ coner.

Soil type: Canyon loam, eroded

Location: Kimball County, Nebraska. 300 feet east and 140 feet north of S1/4 corner Sec. 27, T13N, R56W. About 12 miles south and 3.5 miles west of Kimball, Nebraska.

Topography: About a 2 percent ridgetop in weathered reworked Tertiary sands and silts on the dissected Tertiary plains.

Cultivation: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-9-(1-4)

Lincoln

Lab.No.	Horizon	Description
5846	Alp	0-4 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak fine granular; very friable, moist; strong effervescence; abrupt smooth lower boundary.
5847	AC	4-9 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; clear smooth lower boundary.
5848	C	9-16 inches. Light brownish gray (10YR 6/2 dry) to brown (10YR 5/3 moist) loam; massive structure; very friable, moist; violent effervescence; abrupt wavy lower boundary.
5849	Dr	16-22 inches. Pinkish gray (7.5YR 7/2 dry) to light brown (7.5YR 6/4 moist) partially weathered Tertiary consisting of large amount of limestone fragments with a sandy loam to loam matrix.

Note: 0-16 inches. Limestone fragments on the surface and throughout profile. Fragments consist of 5 to 10 percent of soil mass. In the "Dr" area a 4-inch rodent hole with a 12-inch cavity (nest) was found. Horizons Alp and C were sampled for the Bureau of Public Roads.

OIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Cass LOCATION Saunders County, Nebraska
fine sandy loam, deep

SOIL NOS. 853Nebr-78-4-(1-6) LAB. NO. 1498-1503

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (19mm)		
0-6	Alp	0.4	2.8	7.8	25.4	22.0	30.6	11.0	58.3	9.3	Tr.	fsl	
6-15	Al2	0.2	2.6	8.9	29.0	21.7	27.4	10.2	59.9	6.4	-	fsl	
15-22	AC	0.2	3.0	10.2	32.7	19.2	26.3	8.4	58.9	5.4	-	fsl	
22-29	C1	0.2	2.2	9.3	36.5	13.3	31.9	6.6	64.2	3.0	-	fsl	
29-36	C2	0.2	2.1	10.1	43.7	24.0	15.6	4.3	64.1	2.3	-	lfs	
36-49	C3	0.2	2.0	10.5	38.8	31.0	13.8	3.7	67.4	1.4	-	lfs	
pH		ORGANIC MATTER				8A2	ELECTRI-	6E1a	6F1a	MOISTURE TENSIONS			
8C1b	8C1a	8C1a	6A1a	NITRO-GEN		EST% SALT (BUREAU CUP)	CONDUCTIVITY EC x 10 ³ MILLIMOS PER CM	CoCO ₂ equiv-alent	GYPSSUM mg./100g SOIL	4B1a	4B1a	4B2	
RATED PASTE	1:5	1:10	ORGANIC CARBON %	%	C/N		8A1a	%		1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
5.6	6.0	6.2	1.23			a	0.4					5.8	
5.8	6.0	6.1	0.88				0.4					5.5	
6.3	6.4	6.5	0.60				0.4		-	26.2	11.3	4.6	
6.4	6.6	6.6	0.33				0.4		-	21.9	8.6	3.5	
6.6	6.7	6.7	0.14				0.4		-	17.5	6.2	2.5	
6.8	6.7	6.6	0.05				0.6		-	17.8	5.1	2.1	
5A1a	5B1a	CATIONS				5B1b	5D2	SATURATION EXTRACT SOL.				8A	
CATION EXCHANGE CAPACITY % NH ₄ Ac	EXTRACTABLE		EXCHANGEABLE				EXCH. No %	6P1a	6Q1a	8D3 Ca/Mg	MOISTURE AT SATURATION %		
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	No	K							
	milliequivalents per 100g. soil		milliequivalents per liter										
11.5	6.3	2.3		0.2	1.0	2	0.2	1.2		2.9	30.3		
10.6	7.2	1.6		0.1	0.1	1	0.2	0.4		4.5	33.1		
8.7	6.5	1.2		0.1	0.1	1	0.4	0.1		5.4	30.6		
6.7	5.1	1.0		0.1	0.1	1	0.4	0.1		5.1	24.8		
4.5	3.5	0.6		0.1	0.1	2	0.2	0.1		5.8	24.2		
3.7	3.4	0.6		-	0.1	-	5.0	0.1		5.7	25.9		

a. Less than 0.20%.

Soil type: Cass fine sandy loam, deep
 Soil No.: 853Nebr-78-4-(1-6)
 Location: Five hundred feet north and 100 feet west of the SE corner Sec. 25, T14N, R9E, Saunders County, Nebraska.
 Topographic position: High bottom land not subject to flood.
 Relief: Slight; smooth very gently undulating swells and swales; slope less than 1 percent.
 Drainage: Well drained.
 Ground water: Probably 7 to 10 feet below surface.
 Root distribution: Normal.
 Land use: Cultivated. Corn 1953.
 Described by: B. H. Williams and Donald C. Yost.

Mandan lab. No.	Horizon	
1498	Alp	0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) fine sandy loam; moderate fine and very fine granular; slightly hard, dry; very friable, moist; noncalcareous, some partly decayed crop residues mixed throughout; abrupt smooth lower boundary.
1499	A12	6-15 inches. Dark gray (10YR 4/1 dry) to nearly black (10YR 2.5/1 moist) loam; weak medium and coarse subangular blocky separating to moderate fine crumb and moderate very fine granular; slightly hard, dry; very friable, moist; larger aggregates contain many fine and very fine pores and root openings, noncalcareous; gradual smooth lower boundary.
1500	AC	15-22 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) fine sandy loam; very weak coarse and very coarse subangular blocky breaking to moderate fine and very fine granular; slightly hard, dry; very friable, moist; larger aggregates have many fine and medium size pores and root openings; noncalcareous; gradual smooth lower boundary.
1501	Cl	22-29 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3.5/2 moist) fine sandy loam; weak fine and very fine granular; slightly hard, dry; very friable, moist; many medium and large pores; noncalcareous; some mixing of lighter colored materials from below by worms; gradual smooth lower boundary.
1502	C2	29-36 inches. Light brownish gray (10YR 6/2.5 dry) to grayish brown (10YR 5/2 moist) loamy fine sand; appears massive in place when moist but breaks into very weak medium and fine subangular blocks when dry; slightly hard, dry; very friable, moist; noncalcareous; gradual smooth lower boundary.
1503	C3	36-49 inches. Light brownish gray (10YR 6/2 dry) to grayish brown (10YR 5.5/2 moist) loamy very fine sand; massive, breaking into rounded lumps which when dry crush easily to single grains; slightly hard, dry; very friable, moist; noncalcareous; abrupt lower boundary.
	D	49-60 inches. Not sampled, medium to coarse sand.

SOIL Crete silt loam SOIL Nos 960Nebr-18-1 LOCATION Clay County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 14263-14270 December 1964

Depth (In.)	Horizon	1B1a Size class and particle diameter (mm) 3A1											Coarse fragments		
		Total			Sand				Silt				Int II (2-0.1)	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. > 2			
Pct of < 2 mm															
0-7	Ap	7.6	69.9	22.5	-	0.1	0.1	0.4	7.0	48.2	21.7	55.4	0.6	-	-
7-11	A3	6.1	61.5	32.4	-	-	0.1	0.3	5.7	39.7	21.8	45.5	0.4	-	-
11-15	B21	4.1	46.7	49.2	-	-	-	-	4.1	29.7	17.0	33.8	-	-	-
15-24	B22	5.0	52.4	42.6	-	-	0.1	0.2	4.7	32.2	20.2	37.0	0.3	-	-
24-28	B3	6.5	58.3	35.2	-	-	0.1	0.2	6.2	37.3	21.0	43.6	0.3	-	-
28-38	C1ca	7.9	64.9	27.2	0.2a	0.2a	0.3a	0.6a	6.6b	38.0	26.9	44.9	1.3	tr.	tr.
38-48	C2ca	9.8	70.1	20.8	0.6a	0.3a	0.2b	0.7b	7.3b	41.3	28.8	48.9	1.8	tr.	tr.
48-60	C3ca	7.0	73.3	19.7	0.2a	0.2a	0.2b	0.6b	5.8b	40.9	32.4	47.0	1.2	tr.	tr.
pH															
Depth (In.)	6A1a	6B1a	C/N	6E1c	6C1a	Bulk density			4M1 Water content				pH	6C1a (1:1)	
	Organic carbon Pct.	Nitrogen Pct.			Carbonate as CaCO ₃ Pct.	Ext. Iron as Fe Pct.	4A1a Field State g/cc	4A1c 30-Cm g/cc	4A1d Oven-Dry g/cc	Extensibility	4B4 Field State Pct.	4B3 30-Cm Pct.			4B1b 1/3 Bar Pieces Pct.
0-7	1.48	0.120	12		0.4	1.46	1.35	1.51d	.27	12.8	29.5	19.4	10.2	0.8	6.1
7-11	1.13	0.104	11		0.6	1.48	1.32	1.50d	.17	8.1	28.3	22.6	14.9	0.4	6.1
11-15	0.88	0.084	10		0.7	1.84d	1.22d	1.84d	.52		35.6	32.0	24.0	0.4	6.4
15-24	0.57	0.059	10		0.6	1.72	1.34	1.84d	.90	11.5	30.0	27.8	21.9	0.7	7.1
24-28	0.33			tr.	0.6	1.62	1.35	1.62d	.24	6.9	30.6	29.6	18.0	0.6	7.6
28-38	0.20			1	0.6	1.58	1.28	1.58d	.68	8.2	33.4	27.3	15.0	1.6	7.9
38-48	0.13			2	0.6	1.44	1.34	1.43d	.20	9.9	31.6	27.8	13.4	1.9	8.1
48-60	0.10			tr.	0.6	1.35	1.28	1.42d	.42	14.8	34.8	27.2	13.1	2.2	8.1
Extractable bases 5B1a															
Depth (In.)	6N2b	6O2b	6P2a	6Q2a	5B1a	6H1a	Cat. Ech. Cap.		8D3	Base saturation					
	Ca	Mg	Na	K	Sum	Ext. Acidity	5A3a Sum Cations	5A1a NH ₄ OAc		Ca/Mg	5C3 Sum Cations Pct.	5C1 NH ₄ OAc Pct.			
mg/100 g															
0-7	11.0	3.2	0.1	1.4	15.7	4.8	20.5	16.1			3.4	76	98		
7-11	13.5	5.2	0.2	1.2	20.1	5.3	25.4	20.4			2.6	79	98		
11-15	20.1	9.3	0.4	1.9	31.7	5.1	36.8	30.4			2.2	86	104		
15-24	19.6	9.3	0.6	2.2	31.7	2.3	34.0	29.3			2.1	93	108		
24-28			0.7	2.3				27.6							
28-38			0.7	2.3				24.2							
38-48			1.1	2.3				22.5							
48-60			1.3	2.3				22.9							
Ratios to Clay 8D1															
Depth (In.)	NH ₄ OAc CEC	Ext. Iron	15-Bar Water	a. > 50% Carbonate nodules.			b. 5-25% Carbonate nodules.			c. 9.9 Kg/m ² to 60 inches.			d. One clod		
0-7	.72	.018	.45												
7-11	.63	.018	.46												
11-15	.62	.014	.49												
15-24	.69	.014	.51												
24-28	.78	.017	.51												
28-38	.89	.022	.55												
38-48	1.08	.029	.64												
48-60	1.16	.030	.66												

Soil type: Crete silt loam
 Soil No.: S60Nebr-18-1
 Classification: Maximal Chernozem.
 Location: 0.6 mile west and 135 feet south of the northeast corner Sec. 2, T5N, R8W, Clay County, Nebraska.
 Crop: Sorghum 1958-1960, corn 1957.
 Parent material: Peorian loess.
 Climate: Subhumid.
 Physiography: Nearly level loess upland.
 Relief: Subnormal.
 Slope: 1 percent.
 Aspect: Essentially level with 1 percent slope toward the east.
 Erosion: Slight.
 Permeability: Moderately slow.
 Drainage: Moderately well drained.
 Ground water: Deep.
 Moisture: Near field capacity.
 Root distribution: A few roots extended through to the C horizon.
 Described by: Joseph M. Downs.

ISL No. Horizon

- 14263 Ap 0 to 7 inches. Very dark brown (10YR 2/2 moist uncrushed) (10YR 5/2 dry) silt loam, weak fine granular structure, friable, no effervescence; abrupt smooth lower boundary.
- 14264 A3 7 to 11 inches. Very dark grayish brown (10YR 3/2 moist uncrushed) (10YR 6/2 dry) silty clay loam, weak fine subangular blocky structure, friable, no effervescence; abrupt smooth lower boundary.
- 14265 B21 11 to 15 inches. Dark brown (10YR 3/3 moist uncrushed) (10YR 4/3 moist crushed) (10YR 6/3 dry) silty clay, moderate fine subangular blocky structure, few thin continuous clay films, firm, no effervescence; a vertical dark streak 1/4 inch wide passes through this horizon, through the B22 and into the B3; clear smooth lower boundary.
- 14266 B22 15 to 24 inches. Dark grayish brown (2.5Y 4/2 moist uncrushed) (10YR 6/3 dry) silty clay, moderate medium angular and subangular blocky breaking to fine subangular blocky, common thin continuous clay films, firm, no effervescence; clear smooth lower boundary.
- 14267 B3 24 to 28 inches. Dark grayish brown (10YR 4/2 moist uncrushed) (10YR 7/3 dry) heavy silty clay loam, weak coarse subangular blocky structure, few discontinuous clay films, friable, no effervescence; clear smooth lower boundary.
- 14268 C1ca 28 to 38 inches. Yellowish brown (10YR 5/4 moist uncrushed) (10YR 7/2 dry) heavy silt loam, massive, friable, weak effervescence, many small soft and hard CaCO₃ concretions, a few CaCO₃ veins; smooth gradual lower boundary.
- 14269 C2ca 38 to 48 inches. Yellowish brown (10YR 5/4 moist uncrushed) (10YR 7/2 dry) silt loam, massive, very friable, moderate effervescence, many soft and hard CaCO₃ concretions, many vertical CaCO₃ veins 1 to 2 inches long; smooth gradual lower boundary.
- 14270 C3ca 48 to 60 inches. Yellowish brown (10YR 5/4 moist uncrushed) (10YR 7/2 dry) silt loam, massive, very friable, moderate effervescence, common soft and hard CaCO₃ concretions, many vertical CaCO₃ veins.

SOIL TYPE Crete LOCATION Fillmore County, Nebraska
silt loam

SOIL NOS. S55Neb-30-1-(1-8) LAB. NOS. 3372-3379

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)								3A1		2A2 > 2	TEXTURAL CLASS
		1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002			
0-6	Alp	0.1	-	-	0.2	5.5	69.0	25.2	53.8	20.8	-	sil	
6-8	Al2	0.1	-	-	-	4.5	64.5	30.9	48.0	21.0	-	sic1	
8-10	A3	-	-	-	-	3.7	60.3	36.0	43.2	20.8	-	sic1	
10-19	B21	-	-	-	-	3.2	49.5	47.3	33.6	19.1	-	sic	
19-27	B22	-	-	-	-	2.8	57.1	40.1	36.0	23.9	-	sic	
27-39	B3ca	0.2	0.3	0.1	0.3	3.5	65.4	30.2	41.3	27.8	-	sic1	
39-49	Cca	0.1	0.1	0.1	0.3	4.1	68.6	26.7	44.8	28.1	-	sil	
49-60	C	0.1	0.2	0.2	0.5	3.4	72.0	23.6	45.8	29.9	-	sil	

pH	8C1a			ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C.	6E1a			MOISTURE TENSIONS		
	1:1	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N			CoCO ₃ equiv- alent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4B2 15 ATMOS. %	
5.6	6.2	6.3	2.02	.158	12.8									10.9
5.4	6.1	6.1	1.66	.140	11.8									13.2
5.7	6.1	6.3	1.40	.124	11.3									15.0
6.6	7.2	7.2	0.92	.080	11.5									19.9
7.2	7.6	7.7	0.49	.055	8.9									18.4
7.7	8.3	8.5	0.20					3						15.3
7.9	8.6	8.7	0.12					2						14.2
7.9	8.5	8.7	0.12					2						14.0

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	5C1	MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K			
21.1	12.3	4.5		0.1	1.8	89		
22.6	13.7	5.6		0.2	1.5	93		
25.3	13.8	6.4		0.4	1.2	86		
32.4	19.2	8.8		0.9	1.4	94		
30.8	19.2	10.3		1.3	1.6	100		
26.6		9.4		1.8	1.5			
26.2		8.8		2.1	1.4			
26.4		8.4		2.0	1.4			

a. CaCO₃ in sand of 3379.

Soil type: Crete silt loam
 Soil No.: 855Nebr-30-1-(1-8)
 Location: 1250 feet east and 120 feet north of southwest corner Sec. 2, T6N, R2W, Fillmore County, Nebraska; 1 mile south and $4\frac{1}{2}$ miles east of center of Geneva, Nebraska.
 Physiography: Gentle eastward slope of about 1 percent gradient, in broadly undulating loess-mantled plain.
 Use: Cultivated, corn.
 Collected by: B. H. Williams, J. A. Elder, T. E. Beesely, R. D. Greenawalt, and R. H. Jordan, November 1955.
 Described by: B. H. Williams.

Horizon and
 Mandan
 Lab. Number

A1p 0 to 6 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; medium fine and very fine granular structure; soft, dry; friable, moist; abrupt lower boundary.
 3372

A12 6 to 8 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; weak coarse blocky structure separating to moderate fine granules; soft, dry; friable, moist; clear lower boundary.
 3373

A3 8 to 10 inches. Dark gray to very dark grayish brown or very dark brown with light sprinkling of leached gray silt on peds (10YR 4.5/1 dry to 2.5/2 moist) silty clay loam; strong medium and fine granular and very fine subangular blocky structure; the lower one inch has some of the characteristics of a degrading E1; the peds fall apart quite readily when dry or only slightly moist; hard, dry; firm, moist; abrupt lower boundary.
 3374

B21 10 to 19 inches. Dark brown to very dark brown (10YR 3.5/3 dry to 2.5/3 moist) with 2/2 coating on vertical faces of peds, silty clay; moderate coarse prismatic and strong medium and fine blocky structure; very hard, dry; very firm, moist; noncalcareous; gradual lower boundary.
 3375

B22 19 to 27 inches. Pale brown to brown (10YR 6/3 dry to 5/3 moist) with 5/2, dry, and 4/2, moist, coatings on vertical faces of peds, silty clay; weak to moderate coarse prismatic and strong medium and coarse blocky structure; very hard, dry; very firm, moist; a few very fine dark brown soft iron-manganese specks; fine roots common in this horizon and in the ones above; noncalcareous; clear lower boundary.
 3376

B3ca 27 to 39 inches. Pale yellow to light yellowish brown (2.5Y 7/3 dry to 6/3 moist) silty clay loam; a few faint fine yellow and brown mottles and very fine dark brown iron-manganese soft concretions; weak coarse and medium blocky structure with some stronger faces on the peds along the more pronounced vertical planes; hard, dry; slightly firm, moist; slightly calcareous throughout; soft and hard lime concretions and soft thread lime and very thin lime coating on some of the peds; a few roots and many root channels and pores; gradual lower boundary.
 3377

Cca 39 to 49 inches. Pale yellow (2.5Y 8/3 dry to 7/3 moist) silt loam; common faint fine pale yellow to strong brown mottles; massive except an occasional widely-spaced crack along which some subangular coarse blocks have formed; slightly hard, dry; friable, moist; calcareous except in spots; lime mainly in fine specks, threads, and soft concretions; a few fine roots and many root channels and pores in this horizon and the one below; gradual lower boundary.
 3378

C 49 to 60 inches. White to pale yellow (2.5Y 8/2 dry to 7/3 moist) silt loam; common faint to prominent yellowish brown, brown, and strong brown mottles and streaks of iron staining; massive; soft, dry; friable, moist; generally noncalcareous except on scattering of lime concretions that are 1/8- to 1/4-inch in diameter.
 3379

SOIL TYPE Crete LOCATION Fillmore County, Nebraska
silt loam

SOIL NOS. 855Nebr-30-2-(1-8) LAB. NOS. 3380-3387

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										2A2 > 2	TEXTURAL CLASS
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	3A1		a		
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002			
0-5	A1p	-	0.1	0.1	0.3	5.0	69.5	25.0	53.9	20.8	-	sil	
5-8	A12	-	0.1	-	0.1	3.6	64.0	32.2	44.7	23.1	-	sic1	
8-10	A3	-	0.1	-	-	2.6	57.5	39.8	37.1	23.0	-	sic1	
10-21	B21	0.1	0.1	-	0.1	2.0	47.7	50.0	27.9	21.9	-	sic	
21-25	B22	-	0.1	0.1	0.2	2.0	54.5	43.1	29.4	27.2	-	sic	
25-37	B3ca	0.6	0.4	0.2	0.3	3.1	62.2	33.2	37.3	28.2	-	sic1	
37-48	Cca	0.2	0.4	0.2	0.3	3.6	69.7	25.6	43.2	30.3	-	sil	
48-60	C	0.4	0.2	0.1	0.3	4.0	71.3	23.7	45.4	30.1	-	sil	
pH 8C1a		ORGANIC MATTER					EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	6E1a		MOISTURE TENSIONS		
1:1	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N	CoCO ₃ equiv-alent %			GYP SUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %	
5.6	5.9	6.0	1.96	.160	12.2								10.6
5.6	6.0	6.0	1.79	.154	11.6						14.0		
5.8	6.2	6.4	1.47	.129	11.4						17.0		
6.8	7.3	7.5	1.13	.091	12.4						22.1		
7.6	8.3	8.5	0.63	.065	9.7			2			20.1		
7.6	8.0	8.3	0.33					4			16.8		
7.5	8.0	8.1	0.26					2			15.0		
7.9	8.6	8.9	0.12					3			14.4		
5A1a CATION EXCHANGE CAPACITY MEQ/AC	EXTRACTABLE CATIONS 5B1a					BASE SAT. %						MOISTURE AT SATURATION %	
6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K									
← milliequivalents per 100g. soil →					5C1								
21.1	11.9	5.1		0.2	1.2	87							
24.3	13.4	5.1		0.7	0.9	83							
23.6	14.9	7.1		1.1	1.0	100							
35.7	20.8	10.8		2.4	1.5	99							
32.3		11.6		3.0	1.8								
28.4		11.7		3.7	1.7								
28.0		10.5		3.5	1.8								
26.0		9.7		3.0	1.7								

a. Fe-Mn dark nodules and carbonate nodules in sand of 3383-3387.

Soil type: Crete silt loam

Soil No.: S55Webr-30-2-(1-8)

Location: 1450 feet north and 200 feet west of southeast corner Sec. 33, T8N, R1W, Fillmore County, Nebraska; one mile east and 1-3/4 miles south of Exeter, Nebraska.

Physiography: Gently undulating loess-mantled plain on eastward slope of less than one percent gradient. Surface drainage is into shallow small and large depressions and into shallowly entrenched drains.

Use: Cultivated, corn.

Collected by: B. H. Williams, J. A. Elder, T. E. Beesley, R. D. Greenawalt and R. H. Jordan, November 1955.

Described by: B. H. Williams.

Horizon and
Mandan

Lab. Number

- A1p 0 to 5 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; medium fine and very fine granular structure; soft, dry; friable, moist; noncalcareous; abrupt lower boundary.
3380
- A12 5 to 8 inches. Dark gray to black or very dark brown (10YR 4/1 dry to 2/1.5 moist) silt loam; weak coarse blocky separating easily to fine granular structure; slightly hard, dry; friable, moist; non-calcareous; clear lower boundary.
3381
- A3 8 to 10 inches. Dark gray or gray to very dark brown (10YR 4.5/1 dry to 2/2 moist) silty clay loam; strong fine granular and very fine subangular blocky structure; aggregates fall apart easily when dry and moist; the individual peds are hard when dry and firm when moist and thinly coated with leached gray silt grains that are apparent only when the soil is dry; noncalcareous; clear lower boundary.
3382
- B21 10 to 21 inches. Very dark grayish brown to very dark brown or dark brown (10YR 3/2 dry to 2/2.5 moist) silty clay; moderate coarse prismatic and strong fine and medium blocky structure; very hard, dry; very firm, moist; a very few very fine strong brown and dark brown iron-manganese soft concretions; noncalcareous; gradual lower boundary.
3383
- B22 21 to 25 inches. Light brownish gray to dark grayish brown (2.5Y 6/2 dry to 4/2 moist) silty clay; moderate coarse prismatic and strong fine and medium blocky structure; very hard, dry; very firm, moist; a few very fine iron-manganese soft concretions which are most evident on cut faces of peds; slightly calcareous in the lower 2 or 3 inches including a few fragments of brown-stained lime concretions; plant roots common in this and in the horizons above; clear lower boundary.
3384
- B3ca 25 to 37 inches. Light gray to light olive gray (5Y 7/2 dry to 6/2 moist) heavy silty clay loam; a few faint to prominent fine brown and strong brown mottles and dark brown soft iron-manganese spots and soft concretions; moderate medium and coarse blocky structure; a few well-defined vertical cracks that form prisms 10 or more inches in diameter; slightly darker coating on prism faces than on remainder of ped faces; hard, dry; firm, moist; calcareous, with weak effervescence throughout; many soft and hard lime concretions that effervesce violently with dilute HCl; a few very fine plant roots and root channels; gradual lower boundary.
3385
- Cca 37 to 48 inches. Pale yellow to light yellowish brown (2.5Y 7/3 dry to 6/3 moist) silty clay loam; common fine and coarse yellowish brown, strong brown, and dark brown mottles and a few rounded tubular soft to slightly hard iron concretions; massive but separates along vertical planes into very coarse prisms; slightly hard, dry; friable, moist; calcareous, including a few hard and soft lime concretions and much thread lime; strong effervescence; root channels common but no roots seen in this horizon and the one below; gradual lower boundary.
3386
- C 48 to 60 inches. Pale yellow to light yellowish brown (2.5Y 7/3 dry to 6/3 moist) silt loam; common fine to coarse yellowish brown and strong brown mottles and dark brown soft iron segregations; massive; soft, dry; friable, moist; calcareous including a few threads, seams and spots of segregated lime; weak effervescence between lime spots.
3387

SOIL TYPE Crete LOCATION Saline County, Nebraska
silt loam

SOIL NOS. 855Neb-76-1-(1-9) LAB. NOS. 3354-3362

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a					3A1					
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02		0.02-0.002	
0-6	Alp	-	0.1	0.1	0.3	3.6	71.3	24.6	51.0	24.1	-	sil
6-10	Al2	-	0.1	0.1	0.2	3.4	68.2	28.0	47.4	24.3	-	sic1
10-13	AB	-	0.1	0.1	0.1	2.5	61.4	35.8	39.4	24.6	-	sic1
13-19	B21	-	-	-	0.1	2.1	48.9	48.9	30.8	20.3	-	sic
19-26	B22	-	-	-	-	2.5	52.3	45.2	31.5	23.3	-	sic
26-32	B23	-	-	-	0.1	2.6	55.9	41.4	34.2	24.4	-	sic
32-42	B3ca	0.7	0.2	0.1	0.2	2.6	60.6	35.6	35.7	27.6	-	sic1
42-52	C1ca	0.1	0.1	0.1	0.3	2.7	64.3	32.4	40.4	26.8	-	sic1
52-60	C2	-	0.1	0.1	0.4	2.3	63.7	33.4	39.1	27.1	-	sic1

pH 8C1a		ORGANIC MATTER			EST'S SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM @25-C.	6E1a		MOISTURE TENSIONS		
1:1	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %			C/N	CoCO ₂ equiv-olent %	GYP SUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %
5.6	5.8	6.0	1.77	.142	12.5						10.0
5.6	5.9	6.1	1.65	.138	12.0						11.6
5.8	6.2	6.3	1.36	.122	11.1						15.1
6.2	6.5	6.7	0.94	.088	10.7						20.4
6.7	7.0	7.2	0.58	.059	9.8						19.4
7.2	7.6	7.7	0.43								18.9
7.5	8.1	8.2	0.24				1				16.6
7.4	7.8	7.9	0.16				1				15.6
7.2	7.8	7.8	0.14				1				15.8

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6P2a H	6Q2a No K	5C1		
19.1	11.8	3.4		0.1	1.0	85	
20.7	12.6	4.0		0.1	0.8	84	
23.6	14.2	5.3		0.2	0.8	87	
32.1	19.2	8.1		0.4	1.1	90	
32.5	20.4	8.5		0.5	1.1	94	
30.6	21.4	8.6		0.6	1.1	100	
28.5		8.7		0.7	1.1		
27.7		7.6		0.8	1.1		
28.0		8.9		0.9	1.1		

Soil type: Crete silt loam
 Soil No.: S55Nebr-76-1-(1-9)
 Location: 350 feet north and 80 feet west of southeast corner Sec. 17, T6N, R4E, Saline County, Nebraska; one mile west of Wilber, Nebraska, across road from west entrance to cemetery.
 Physiography: Nearly level loess plain; less than 1 percent slope to the south but enough slope to give adequate surface drainage.
 Use: Cultivated, corn.
 Collected by: B. H. Williams, J. A. Elder, T. E. Beesley, R. D. Greenawalt and R. H. Jordan, November 1955.
 Described by: B. H. Williams.

Horizon and
 Mandan
 Lab. Number

- Alp
 3354 0 to 6 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) silt loam; weak very fine granular; soft, dry; very friable, moist; noncalcareous; abrupt lower boundary.
- Al2
 3355 6 to 10 inches. Dark gray to very dark brown (10YR 4/1 dry to 2/2 moist) heavy silt loam or silty clay loam; breaks out in medium and coarse blocks but separates into weak thick plates (tillage compaction) and moderate fine granules; hard, dry; friable, moist; noncalcareous; clear lower boundary.
- AB
 3356 10 to 13 inches. Very dark gray to very dark brown with faint gray sprinkling of leached silt on surface of dry pedis (10YR 3/1.5 dry to 2/2.5 moist) silty clay loam; moderate fine granular in upper part grading to strong very fine subangular blocky structure in the lower part; hard, dry; friable, moist; noncalcareous; abrupt lower boundary.
- B21
 3357 13 to 19 inches. Grayish brown or dark grayish brown to dark brown (10YR 4.5/2.5 dry to 3/3 moist) silty clay; moderate coarse prisms and strong coarse blocks separating with moderate pressure into strong fine blocks; very hard, dry; very firm, moist; many very fine dark brown iron-manganese soft concretions; noncalcareous; gradual lower boundary.
- B22
 3358 19 to 26 inches. Brown to dark brown (10YR 5/3 dry to 3/3 moist) silty clay; moderate coarse prisms and blocks separating to strong fine blocks; very hard, dry; very firm, moist; many fine dark brown iron-manganese soft concretions; noncalcareous; gradual lower boundary.
- B23
 3359 26 to 32 inches. Pale brown to brown (10YR 6/3 dry to 5/3 moist) silty clay; weak coarse prismatic and moderate to strong coarse blocky structure; very hard, dry; very firm, moist; iron-manganese concretions as noted in horizons above; noncalcareous; living and dead plant roots common in this horizon and horizons above; clear wavy lower boundary.
- B3ca
 3360 32 to 42 inches. Pale yellow to light olive brown (2.5Y 7/3 dry to 5/4 moist) silty clay loam; moderate medium and fine blocky structure with better-defined vertical than horizontal faces; a few very fine dark brown iron-manganese soft concretions throughout the horizon; hard, dry; friable, moist; calcareous, with many white soft and hard lime concretions; only weak effervescence between lime spots; only a few plant roots present; old root channels and pores common; clear wavy lower boundary.
- Clca
 3361 42 to 52 inches. Pale yellow to light olive brown (2.5Y 7/3 dry to 5/4 moist) heavy silt loam or silty clay loam; a few faint fine gray and yellowish brown mottles and very fine dark brown iron-manganese soft concretions; mostly massive but an occasional vertical cracking plane shows slight darkening on the plane surfaces; slightly hard, dry; friable, moist; the soil mass is noncalcareous but a sprinkling of soft lime concretions is present, about one to each six-inch square of an exposed vertical section; a very few living roots present but old root channels and pores common; gradual lower boundary.
- C2
 3362 52 to 60 inches. Pale yellow to light olive brown (2.5Y 7/4 dry to 5/4 moist) heavy silt loam; a few faint fine gray and light yellowish brown mottles; massive, except an occasional widely-spaced vertical crack; slightly hard, dry; friable, moist; the soil mass is noncalcareous; an occasional fine spot effervesces weakly with dilute HCl; old root channels and pores common but no fresh roots observed.

SOIL SURVEY LABORATORY Lincoln, Nebr.

8/1/57

SOIL TYPE Crete LOCATION Saline County, Nebraska
silt loam

SOIL NOS. S55Neb-76-2-(1-9) LAB. NOS. 3363-3371

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2			
2.1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-5	A1p	-	0.1	0.1	0.3	4.1	68.2	27.2	48.7	23.8	-	sic1
5-8	A12	-	-	0.1	0.2	3.5	63.4	32.8	43.2	23.8	-	sic1
8-11	AB	-	0.1	-	0.1	3.1	60.8	35.9	40.1	23.9	-	sic1
11-21	B21	0.1	-	-	0.1	2.3	52.7	44.8	31.9	23.2	-	sic
21-31	B22	0.1	-	-	-	2.6	55.3	42.0	33.6	24.3	-	sic
31-42	B23	-	-	-	0.1	2.8	59.5	37.6	35.9	26.5	-	sic1
42-53	B3ca	0.4	0.2	0.1	0.3	2.9	63.9	32.2	39.2	27.8	-	sic1
53-57	Cca	-	0.1	0.1	0.3	3.0	64.7	31.8	42.0	25.9	-	sic1
57-62	C	-	-	0.1	0.3	3.2	63.2	33.2	41.6	25.0	-	sic1
pH8C1a		ORGANIC MATTER					ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM @25°C		MOISTURE TENSIONS			
1:5		6A1a	6B1a	5B1a		EST% SALT (BUREAU CUP)	6E1a	MOISTURE TENSIONS				
1:10		ORGANIC CARBON	NITROGEN	C/N				CoCO ₃ equiv-alent	GYPSUM mc./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:1		%		%								
5.6	5.8	5.8	2.24	.195	11.5							11.4
5.7	5.9	6.0	1.95	.175	11.1							14.2
5.9	6.3	6.3	1.63	.148	11.0							15.6
6.2	6.6	6.7	0.90	.086	10.5							18.8
6.6	7.3	7.5	0.55	.056	9.8							18.1
6.9	7.5	7.8	0.30					1				17.1
7.5	8.2	8.4	0.16					2				15.8
7.5	8.0	8.3	0.14					1				15.5
7.2	7.7	7.8	0.13					1				15.7
5A1a	EXTRACTABLE CATIONS 5B1a					BASE SAT. %						
CATION EXCHANGE CAPACITY NH4Ac	6N2b	6O2b	6P2a		6Q2a							
	Ca	Mg	H	Na	K							
← milliequivalents per 100g. soil →						5C1						
21.6	12.2	4.6		0.1	1.6	86						
23.6	15.4	6.0		0.1	1.1	96						
24.6	15.1	6.2		0.2	0.8	91						
29.4	18.4	7.9		0.5	1.0	94						
28.9	19.6	8.5		0.8	1.1	100						
28.1		9.4		1.1	1.3							
26.9		8.5		1.2	1.2							
27.5		8.0		1.2	1.2							
27.2		8.3		1.2	1.3							
						MOISTURE AT SATURATION %						

Soil type: Crete silt loam
 Soil No.: 855Nebr-76-2-(1-9)
 Location: 1250 feet south and 100 feet west of northeast corner Sec. 29, T7N, R4E, Saline County, Nebraska.
 Physiography: About 1 percent north slope in broad, undulating loess-mantled plain.
 Use: Cultivated, grain sorghum.
 Collected by: B. H. Williams, J. A. Elder, T. E. Beesley, R. D. Greenawalt, and R. H. Jordan, November 1955.
 Described by: B. H. Williams.

Horizon and

Mandan

Lab. Number

- Alp 3363 0 to 5 inches. Dark gray to very dark brown (10YR 4.5/1.5 dry to 2/2 moist) silt loam; moderate fine and very fine granular structure; soft, dry; friable, moist; noncalcareous; abrupt lower boundary.
- A12 3364 5 to 8 inches. Dark gray or dark grayish brown to very dark brown (10YR 4/1.5 dry to 2/2 moist) heavy silt loam; moderate fine granular structure; slightly hard, dry; friable, moist; noncalcareous; clear lower boundary.
- AB 3365 8 to 11 inches. Very dark grayish brown to very dark brown with gray sprinkling of leached silt on surface of dry pedis (10YR 3/2 dry to 2/2.5 moist) silty clay loam; strong fine granular and very fine subangular blocky structure; hard, dry; friable, moist; noncalcareous; clear to abrupt lower boundary.
- B21 3366 11 to 21 inches. Dark grayish brown to dark brown (10YR 4/2.5 dry to 3/3 moist) silty clay; moderate coarse prismatic and strong fine blocky structure in upper part and strong medium blocky structure in lower part; very hard, dry; very firm, moist; a few very fine dark brown and strong brown iron-manganese soft concretions; noncalcareous; many plant roots in this horizon and the horizons above; gradual lower boundary.
- B22 3367 21 to 31 inches. Grayish brown or brown to dark grayish brown or dark brown (10YR 5/2.5 dry to 3.5/2.5 moist) silty clay; moderate coarse prismatic and strong medium and coarse blocky structure; very hard, dry; very firm, moist; a few very fine dark brown iron-manganese soft concretions; noncalcareous; plant roots common; gradual lower boundary.
- B23 3368 31 to 42 inches. Pale brown to brown (10YR 6/3 dry to 5/3 moist) heavy silty clay loam; weak coarse prismatic and moderate coarse blocky structure; very hard, dry; firm, moist; a few very fine dark brown iron-manganese soft concretions; noncalcareous; plant roots few and old root channels common; clear wavy lower boundary.
- B3ca 3369 42 to 53 inches. Pale yellow to light olive brown (2.5Y 7/4 dry to 5/4 moist) silty clay loam; a few faint fine gray mottles and a few very fine dark brown iron-manganese soft concretions; moderate medium coarse blocky structure with strongly-defined faces on blocks along some of the vertical cracking planes; hard, dry; firm, moist; soft and hard lime concretions common but the soil mass is generally noncalcareous; a few fine roots and many old root channels and pores; gradual wavy lower boundary.
- Cca 3370 53 to 57 inches. Pale yellow to light yellowish brown or light olive brown (2.5Y 7/4 dry to 5.5/4 moist) heavy silt loam or silty clay loam; massive except for a few widely-spaced vertical cracks; hard, dry; friable, moist; a few faint fine gray mottles and very fine dark brown iron-manganese soft concretions; calcareous; effervesces mainly on spots, streaks, and soft and hard lime segregations; few or no living roots but old root channels common; gradual lower boundary.
- C 3371 57 to 62 inches. Pale yellow to light yellowish brown (2.5Y 7/4 dry to 6/4 moist) heavy silt loam; massive except an occasional widely-spaced vertical crack; a few faint fine gray and yellowish brown mottles; hard, dry; friable, moist; noncalcareous except an occasional fine speck that will effervesce with dilute HCl; no roots observed, but old root channels and tube-like pores are common.

Horizons Alp, B21, B22 and B3ca were sampled for Bureau of Public Roads.

OIL TYPE Crofton LOCATION Dixon County, Nebraska
silty clay loam, eroded

SOIL NOS. 559Nebr-26-3-(1-6) LAB. NOS. 11386-11391

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									TEXTURAL CLASS		
		1B1a		3A1					2A2				
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002 (19mm)		> 2	
0-6	Ap	0.1a	0.2a	0.2a	0.9a	8.0a	66.2	24.4	55.0	19.8	Tr.	s11	
6-12	AC	0.1a	0.1a	0.1a	0.7a	8.7a	66.3	24.0	56.6	18.9	Tr.	s11	
12-20	C1	<0.1	0.1b	0.1b	0.7b	8.2b	68.0	22.9	56.6	20.1	Tr.	s11	
20-36	C2	0.1b	0.1b	0.1b	0.9b	9.5b	68.0	21.3	60.8	17.3	Tr.	s11	
36-48	C3	0.1b	0.1b	0.1b	0.6b	13.7b	65.4	20.0	62.1	17.4	Tr.	s11	
48-60	C4	0.1b	<0.1	<0.1	0.6b	12.1b	66.8	20.4	62.3	17.0	Tr.	s11	
8C1a		pH		ORGANIC MATTER			Free Iron	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
1:1		1:5	1:10	ORGANIC CARBON	NITROGEN	C/N	Fe ₂ O ₃ %	EC · 10 ³	CoCO ₃ equiv-olent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
				%	%		6C1a	MILLIMHOS PER CM @25°C.	%		%	%	%
8.0				1.12	0.115	9.7	1.2		8				11.0
8.0				0.34	0.045	8	1.3		9				10.4
8.0				0.23	0.035		1.3		9				10.6
8.1				0.16	0.027		1.2		9				10.0
8.2				0.13			1.2		8				9.7
8.2				0.12			1.3		8				9.4
5A1a		EXTRACTABLE CATIONS					5B1a	BASE SAT.	Base	Sum	Sum	Ca/Mg	MOISTURE AT SATURATION
CATION EXCHANGE CAPACITY NH ₄ Ac		6O2b	6H1a	6P2a	6C2a		NH ₄ Ac EXCH.	Est. % on Sum Cations	Ext. Bases	Ext. Cations			%
		milliequivalents per 100g. soil											
18.6		2.8	<0.1	<0.1	0.8								
17.2		3.2	<0.1	<0.1	0.5								
17.6		4.3	<0.1	0.1	0.4								
16.8		5.0	<0.1	0.1	0.4								
16.8		6.3	<0.1	0.1	0.4								
16.8		7.4	<0.1	0.1	0.4								
a.		Few carbonate concr. (CaCO ₃ ?)											
b.		Few (Fe-Mn?) concr. Few carbonate concr. (CaCO ₃ ?)											

Soil type: Crofton silty clay loam, eroded

Soil No.: S59Nebr-26-3-(1-6)

Location: 750 feet south and 600 feet east of northwest corner Sec. 22, T28N, R4E, Dixon County, Nebraska. Northeast Nebraska Experiment Station.

Physiography: Rolling loess hills.

Relief: 50 to 100 feet.

Slope: 10 percent south, convex.

Parent material: Peorian loess.

Drainage: Well.

Permeability: Moderate.

Land use: Cultivated.

Described by and date: J. V. Drew and J. A. Elder, June 26, 1959.

Lincoln

Lab. No. Horizon Depth

11386	A _p	0-6"	Very dark grayish brown (10YR 3/2 moist) silty clay loam. Weak fine and very fine granular structure. Friable moist, hard dry. Violent effervescence, scattered hard lime concretions. Abrupt smooth boundary.
11387	AC	6-12"	Dark brown (10YR 4/3 moist) silty clay loam. Weak fine subangular blocky structure. Friable moist, hard dry. Numerous hard lime concretions 1/8 to 3/8" in diameter. Violent effervescence. Clear wavy boundary.
11388	C ₁	12-20"	Dark brown (10Y 4/3 moist) crushes to (10YR 5/3 moist) silty clay loam. Weak coarse subangular blocky structure. Very friable moist, slightly hard dry. Few faint medium gray mottles and few distinct fine yellowish brown and brown iron stains. Violent effervescence; scattered hard lime concretions 1/8 to 1/2" in diameter. Gradual smooth boundary.
11389	C ₂	20-36"	Light olive brown (2.5Y 5/3 moist) silty clay loam. Weak coarse prismatic structure. Very friable moist, slightly hard dry. Common fine, distinct strong brown and dark brown iron stains. Violent effervescence; few scattered lime concretions and small pores and openings filled with lime. Gradual smooth boundary.
11390	C ₃	36-48"	Similar to horizon above. Consistence is soft dry. Dark brown iron stains are common, distinct, medium. Gradual smooth boundary.
11391	C ₄	48-60"	Light olive brown (2.5Y 5/3 moist) silty clay loam. Massive. Very friable moist, soft, dry. Violent effervescence, very few lime concretions. Iron stains are common, distinct, fine yellow brown and dark brown.

SOIL TYPE Daves Loam LOCATION Deuel County, Nebraska

SOIL NOS. S58Nebr-25-3-(1-7) LAB. NOS. 9403-9409

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		3A1										
		1B1a	2A2	> 2 (1.9mm)								
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	0.002-0.0002	12
0-6	A1p	6.4	6.3	3.2	3.9	15.0	49.7	15.5	49.5	17.0	Tr.	1/sil
6-8	A2	3.7	3.8	2.1	2.9	14.1	58.8	14.6	52.2	22.1	Tr.	sil
8-16	B2	0.6	0.9	0.4	1.0	10.2	45.8	41.1	39.6	17.0	Tr.	sic
16-24	B3	0.2	0.3	0.2	0.7	16.8	61.3	20.5	55.9	22.7	-	sil
24-32	C1	0.1	0.3	0.2a	0.8a	22.1a	62.4	14.1	63.6	21.5	-	sil
32-40	C2	2.6	2.4a	1.7a	2.9a	26.3a	51.0	13.1	62.9	16.0	-	sil
40-51	D	42.2	35.6	11.9	6.3	0.2	1.3	2.5	2.0	0.8	27	cos

pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	MOISTURE TENSIONS			
8C1a		6A1a	6B1a		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv. vol%	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N		6A1a			%	%	%
6.4		0.88	0.078	11	<0.20	0.5					7.1
7.2		0.50	0.053	9	<0.20	0.6	<1				5.7
7.9		0.97	0.101	10	<0.20	1.2	<1				18.6
8.5		0.40	0.052	8	<0.20	1.9	4				12.8
8.7		0.20			<0.20	1.1	11				10.8
8.6		0.14			<0.20	1.3	8				8.8
9.4		<0.01			<0.20	1.0	<1				1.4

5A1a	EXTRACTABLE CATIONS					5D2	SAT. EXT. SOL.		4B1	4A1a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6F1a	6Q1a	Field State Water %	Vol. Wts. g/cc	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K		me. per liter	K			
11.8	6.4	2.2	3.2	0.2	2.1	2	1.1	1.2			40.0
10.3	6.0	2.4	1.6	0.7	1.7	6	2.9	0.8			37.0
30.7	18.7	9.8	<0.1	3.5	4.4	10	7.0	1.1	19.5	1.48	72.1
24.0			<0.1	3.8	4.3	12	12.4	1.6			60.6
18.2			<0.1	3.2	3.8	15	7.4	1.1	15.7	1.30	52.4
16.6			<0.1	2.9	3.4	15	8.7	1.3			48.2
3.0			<0.1	0.6	0.4	13	6.1	0.8			31.6

a. Few CaCO₃ concz.

Soil type: **Daves loam**

47

Soil No.: **S58Nebr-25-3-(1-7)**

Location: **.2 mile east and 180 feet south of northwest corner Sec. 4, T12N, R45W; approximately 3 miles south and 1 mile east of Chappell, Deuel County, Nebraska.**

Physiography: **Loess-covered gravel plain.**

Relief: **Nearly level.**

Slope: **Less than 1 percent.**

Parent material: **Loess over Pleistocene gravels.**

Drainage: **Well drained.**

Permeability: **Moderately slow.**

Salt or alkali: **None.**

Land use: **Wheat 1958.**

Climate: **Average annual precipitation 18.5 inches; average annual temperature 49°F.**

Collected by and date: **John Elder, W. McKinzie and Robert Jordan, Oct. 23, 1958.**

Lincoln

Lab.

No. Horizon

- 9403 Alp 0-6", Grayish brown (10YR 5/2dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
- 9404 A2 6-3", Gray (10YR 6.5/1 dry) to dark gray (10YR 4/1 moist) very fine sandy loam; weak medium subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
- 9405 B2 8-16", Dark grayish brown (10YR 3.5/2) to very dark brown (10YR 2/2 moist) silty clay loam; moderate medium and coarse columnar breaking to moderate fine and medium blocks; dry hard, moist firm; noncalcareous; clear smooth boundary.
- 9406 B3 16-24", Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak coarse prismatic; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9407 C1 24-32, Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9408 C2 32-40", Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; abrupt smooth boundary.
- 9409 D 40-51", Fine to coarse Pleistocene gravels, well rounded.

Scattered gravels throughout the profile. Horizons Alp, B2 and C1 sampled for Bureau of Public Roads.

SOIL TYPE Daves LOCATION Deuel County, Nebraska
loam

SOIL NOS. S58Nebr-25-4-(1-7) LAB. NOS. 9410-9416

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											2A2
		VERY COARSE SAND 2.1	COARSE SAND 1.0-5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (19mm)		
0-5	Alp	3.4	3.5	2.3	3.4	14.5	55.3	17.6	51.7	19.8	10	sil	
5-7	A2	4.2	3.6	2.6	4.0	15.3	57.7	12.6	54.8	20.1	Tr.	sil	
7-14	B2	0.6	0.7	0.5	1.1	8.5	38.8	49.8	34.1	13.8	-	c	
14-17	B3	0.3	0.4	0.2a	0.8a	13.9a	62.9	21.5	50.8	26.5	-	sil	
17-25	C1	0.1	0.3	0.2b	1.0b	20.4b	65.2	12.8	61.3	25.0	-	sil	
25-33	C2	1.1b	0.7b	0.5b	1.4b	24.6b	60.7	11.0	65.3	20.9	Tr.	sil	
33-44	D	18.6	23.9	17.8	25.7	3.7	3.7	6.6	14.5	2.3	44	cos	

pH	ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6F1a	MOISTURE TENSIONS			
	8C1a	6A1a	6B1a	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CoCO ₂ equiv- alent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.
	1:5	1:10	C/N	%	%	%	%	%	%	%
6.4		1.19	0.116	10.2	<0.20	0.5				8.0
7.8		0.59	0.068	9	<0.20	0.6				5.1
8.0		0.99	0.107	9	<0.20	0.9				23.5
8.7		0.51	0.061	8	<0.20	1.1				14.0
8.7		0.30	0.036	8	<0.20	0.9				11.5
8.6		0.16			<0.20	0.8				9.8
9.3		0.02			<0.20	0.9				2.7

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5D2	SAT. EXT. SOL.		4B4	4A1a	8A
	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6F1a Na	6Q1a K	Field State Water %	Vol. Wts. g/cc	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K		me. per liter-->				
13.4	7.0	2.4	4.0	0.4	2.7	2	1.5	1.3			45.6
9.4	5.1	2.0	0.8	1.0	2.0	8	3.8	0.9			40.3
35.3	16.6	11.3	0.4	5.0	6.8	13	6.2	1.0	22.6	1.43	80.0
24.7			<0.1	4.2	5.6	15	8.1	1.4			61.0
20.0			<0.1	2.7	5.1	12	5.4	1.5	10.9	1.30	53.7
18.2			<0.1	1.8	4.9	9	4.1	1.6			47.0
5.2			<0.1	0.9	1.0	15	5.9	1.1			23.6

a. Few CaCO₃ condr.
b. Few CaCO₃ condr.; trace smooth black condr. (Mn?)

Soil type: **Daves loam**

Soil No.: 558Nebr-25-4-(1-7)

Location: .2 mile south and 180 feet west of northeast corner Sec. 6, T12N, R45W; approximately 3.5 miles south and .5 mile west of Chappell, Deuel County, Nebraska.

Physiography: Loess-covered gravel plain.

Relief: Slight.

Slope: Less than 1 percent, plain.

Parent material: Loess over Pleistocene gravels.

Drainage: Well drained.

Permeability: Moderately slow.

Salt or alkali: None.

Land use: Wheat 1958.

Climate: Average annual precipitation 18.5 inches; average annual temperature 49°F.

Collected by and date: John Elder, W. McKinzie and Robert Jordan, Oct. 23, 1958.

Lincoln

lab.

No. Horizon

- 9410 Alp 0-5", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
- 9411 A2 5-7", Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) loam; weak medium subangular blocky; dry soft, moist very friable; noncalcareous; abrupt smooth boundary.
- 9412 B2 7-14", Very dark grayish brown (10YR 3/2 dry) to very dark brown (10YR 2/2 moist) silty clay loam; moderate medium and coarse columnar breaking to moderate fine and medium blocks; dry hard, moist firm; noncalcareous; clear smooth boundary.
- 9413 B3 14-17", Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) silt loam; weak coarse prismatic; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9414 C1 17-25", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9415 C2 25-33", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; abrupt smooth boundary.
- 9416 D 33-44", Fine to coarse pleistocene gravels (well rounded).

Scattered gravels throughout profile. Horizons Alp, B2 and C1 sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY
Mandan, North Dakota

SOIL TYPE Exline silt loam

SOIL NO. S51Nebr-40-7-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
			1B1a		3A1						2A2			
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002		0.2-0.02	> 2 (19mm)		
917	0-5	A1	0.1	0.3	0.8	3.2	16.5	60.4	18.7	18.3	60.3	-	sil	
918	5-10	A2	0.1	0.3	0.6	1.9	18.7	59.5	18.9	16.7	62.5	-	sil	
919	10-18	B2	-	0.3	0.7	1.8	13.7	46.3	37.2	15.3	45.8	-	sic1	
920	18-21	B3	-	0.2	0.5	0.9	11.9	42.4	44.1	15.3	39.5	-	sic	
921	21-28	Bcacs	0.7	0.7	0.6	1.2	14.9	48.0	33.9	19.0	44.5	1 a	sic1	
922	28-42	C1	0.8	0.6	0.6	1.1	15.3	52.7	28.9	20.9	47.7	3 a	sil	
923	42-47	C2	2.3	2.3	1.3	1.9	15.1	53.5	23.6	22.4	47.3	9 a	sil	
924	47-60	C3	0.5	0.8	0.6	1.2	18.3	54.3	24.3	20.1	53.2	1 a	sil	
pH			ORGANIC MATTER				8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM ²	CaCO ₃ equivalent per cent	GYPSUM me./100g SOIL	MOISTURE TENSIONS (per cent)			
SATURATED PASTE		1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
8C1b	8C1a	8C1a	6A1a				8A1a	6E1a	6F1a				4B2	
5.8	6.1	6.7	3.16				-	0.6	tr	-			10.9	
6.0	6.8	7.1	1.59				-	0.7	tr	-			9.0	
7.2	8.2	8.6	1.21				-	1.5	tr	-			19.4	
8.0	8.6	8.9	0.63				-	3.1	tr	-			23.3	
8.1	8.2	8.5	0.27				0.37	9.0	4	25			19.2	
8.3	9.2	9.7	0.15				0.24	6.0	9	-			16.4	
8.2	9.5	9.7	0.10				-	3.3	17	-			12.4	
8.0	9.4	9.6	0.09				-	2.1	5	-			14.2	
5A1a CATION	5B1a CATIONS				5B1b	5D2	SATURATION EXTRACT SOLUBLE 8A1						8A PER CENT MOISTURE AT SATURATION	
EXCHANGE CAPACITY	EXTRACTABLE		EXCHANGEABLE		EXCHANGEABLE SOIL/100 PERCENTAGE ESP	6F1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄			
meq/100g	Ca 6N2b	Mg 6O2b	Na 6P2a	K 6Q2a				milliequivalents per liter						
21.0	9.4	3.6	0.1	2.6	tr	0.1	2.9						56.6	
16.8	6.7	3.9	0.5	2.3	3	3.3	1.3						47.4	
28.3	8.8	10.6	4.5	4.7	16	12.6	0.9						65.4	
32.9	9.4	15.0	6.3	5.8	19	24.6	1.8						94.6	
26.4			4.7	4.6	18	74.0	6.7						72.9	
23.5			4.9	4.1	21	54.0	3.8						70.0	
19.7			4.1	3.5	21	27.6	2.2						56.1	
22.8			3.8	3.7	17	16.7	1.2						55.0	
a. Largely calcareous concretions.														

Soil type: Ecline silt loam
 Soil No.: S51Nebr-40-7-(1-8)
 Location: SW1/4, SE1/4, Sec. 10, T11N, R11W, Hall County, Nebraska.
 Vegetation: Native pasture; saltgrass, grama, and western wheat grass dominant.
 Parent material: Loess.
 Physiographic position: Undulating terrace with numerous micro depressions.
 Topography: Level.
 Slope: Less than 1 percent.
 Erosion: None or slight.
 Drainage: Very slow.
 Moisture: Moist.
 Stoniness: None.
 Root distribution: Good.
 Described by: E. H. Williams.
 Date: October 8, 1951.

Mandan

Lab.No.	Horizon	
917	A1	0-5 inches. Silt loam; dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist); fine granular; soft; friable.
918	A2	5-10 inches. Silt loam; grayish brown (10YR 5/2 dry) to very dark gray (10YR 3/1 moist) silt loam, coarse blocky or prismatic primary and fine blocky secondary breakage. The structure aggregates are coated with lighter-colored material than the base color above.
919	B2	10-18 inches. Silty clay; very dark brown (10YR 2/2 dry) and only slightly darker when moist, silt clay; strongly developed coarse columnar-prismatic structure with secondary breakage to medium and fine blocky. The structure aggregates are heavily coated with black shiny organic colloids. The columns become ill-defined in their lower parts and grade into the next layer below.
920	B3	18-21 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 slightly moist), silty clay or heavy silty clay loam; medium to fine blocky; firm moist, moderately hard dry; moderately plastic wet.
921	Bca-cs	21-28 inches. Silty clay loam; light gray (5Y 7/2 dry) to olive gray (5Y 5/2 moist) silty clay loam; no well defined structure but crushes to fine subangular blocky mass; very high in salts, probably gypsum and scattered hard lime carbonate concretions. The soil mass generally is not calcareous.
922	C1	28-42 inches. Silt loam; pale yellow (5Y 6.5/3 dry) to pale olive (5Y 5.5/3 moist); massive friable; calcareous, including small and large (1-inch diameter) lime concretions.
923	C2	42-47 inches. Silt loam; light gray (5Y 7/2.5 dry) to olive gray (5Y 5/2.5 moist) silt loam; massive friable; strongly calcareous, including moderate abundant lime concretions, some up to 2 or 3 inches in their largest diameters. Common, reddish brown and yellowish red, small, distinct mottlings.
924	C3	47-60 inches. Silt loam; pale yellow (5Y 7/3 dry) to olive (5Y 5/3 moist); massive friable; moderately calcareous; scattered lime concretions; numerous mottlings, marblings and staining of yellow and brown coloration.

Note: Sampled from Ecline soil complex area of about mid-position in the micro topography.

SOIL TYPE Goshen

LOCATION Deuel County, Nebraska

silt loam

SOIL NOS. S58Nebr-25-1-(1-7)

LAB. NOS. 9389-9395

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1					2A2			
		VERY COARSE SAND 2.1	COARSE SAND 1.05	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.075		0.075-0.002	
0-5	A1p	0.2	0.6	1.8	7.7	23.0	47.8	18.9	58.2	17.6	-	1
5-13	A12	0.3	0.8	2.2	10.4	23.7	41.5	21.1	57.7	14.1	Tr.	1
13-24	B21	0.3	0.8	2.3	10.0	23.0	38.8	24.8	54.4	13.8	Tr.	1
24-30	B22	0.1	0.4	1.2	6.5	24.3	42.7	24.8	56.5	14.9	Tr.	1
30-37	B3	0.1	0.3a	0.9a	4.7a	28.7a	47.3	18.0	63.0	16.3	Tr.	1
37-47	Cca	0.3a	0.7a	1.8a	7.7a	29.1a	44.3	16.1	63.2	15.3	Tr.	1
47-60	D	1.0	2.8	9.5	35.5	23.4	10.0	17.8	50.9	3.9	Tr.	fsl

pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	MOISTURE TENSIONS			
1:5	1:10	6A1a ORGANIC CARBON	6B1a NITROGEN	C/N	EST. SAL. 7 (BUREAU CUP)	EC x 10 ³ MILLIMOS PER CM	CaCO ₃ equiv. %	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.
		%	%				%		%	%	%
6.1		1.48	0.123	12.0	<0.20	0.4					9.3
6.7		0.81	0.081	10	<0.20	0.4	∇				9.8
7.2		0.57	0.061	9	<0.20	0.4	∇				11.0
7.5		0.47			<0.20	0.4	∇				11.4
8.0		0.32			<0.20	0.6	4				10.1
8.2		0.22			<0.20	0.6	8				9.4
8.3		0.09			<0.20	0.6	6				8.4

5A1a	EXTRACTABLE CATIONS					5B1a	BASE SAT. %	SAT. EXT. SOL.		4B1	4A1a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K	BASE SAT. % NH ₄ Ac EXCH.	6P1a Na	6Q1a K		Field State Water %	Vol. Wts. #/cc	MOISTURE AT SATUR. RATION %
← milliequivalents per 100g. soil →						5C1	← me. per liter →					
16.6	10.6	2.4	5.2	0.1	1.7	89	0.2	0.9				46.6
16.8	12.4	3.3	2.4	<0.1	1.2	100	0.3	0.4				47.0
19.4	14.2	4.3	2.4	0.1	1.6	104	0.5	0.5		13.8	1.58	52.2
21.2	15.4	5.5	1.6	0.1	2.1	109	0.5	0.7				51.4
18.0			<0.1	0.1	2.3		0.7	1.0				46.2
15.7			<0.1	0.3	2.2		1.8	1.1		15.3	1.40	41.3
12.3			<0.1	0.3	1.5		1.8	1.0		9.9	1.66	45.9

a. Trace smooth dark brown to black concr. (Fe-Mn); few CaCO₃ concr.

Soil type: Goshen silt loam

Soil No.: S58Nebr-25-1-(1-7)

Location: 450 feet east and 180 feet north of southwest corner Sec. 21,
T14N, R42W, approximately 7 miles north and 4 miles west of Big
Springs, Deuel County, Nebraska.

Physiography: Swale in loess-mantled residual uplands.

Relief: Slight.

Slope: Less than 1 percent, plain.

Aspect: Just below footslope position.

Parent material: Loess and alluvium.

Drainage: Well drained.

Permeability: Moderate.

Salt or alkali: None.

Land use: Wheat 1958.

Climate: Average annual precipitation 18.5 inches; average annual temperature 49° F

Collected by and date: John Elder, W. McKinzie and Robert Jordan, October 23, 1958.

Lincoln

lab.

No. Horizon

- 9389 Alp 0-5", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky; dry slightly hard, moist friable; noncalcareous; abrupt smooth boundary.
- 9390 A12 5-13", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
- 9391 B21 13-24", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) light silty clay loam; moderate coarse prismatic breaking to moderate fine and medium subangular blocks; dry slightly hard, moist friable; noncalcareous; clear smooth boundary.
- 9392 B22 24-30", Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry soft, moist very friable; noncalcareous; clear smooth boundary.
- 9393 B3 30-37", Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry soft, moist very friable; slight effervescence; gradual smooth boundary.
- 9394 Cca 37-47", Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; abrupt smooth boundary.
- 9395 D 47-60", Very pale brown (10YR 7/3 dry) to reddish yellow (7.5YR 6/6 moist) loam; massive; dry soft, moist very friable; violent effervescence.

NOTE: D horizon - Tertiary material - Ogallala. Few scattered medium gravels throughout the profile. Worm activity throughout profile and very prominent in the B3 horizon. Horizons Alp, B21 and Cca were sampled for Bureau of Public Roads.

SOIL TYPE Goshen LOCATION Deuel County, Nebraska
silt loam

SOIL NOS. S58Nebr-25-2-(1-7) LAB. NOS. 9396-9402

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	> 2	
2-1	1.0-5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-7	A1p	0.1	0.7	1.1	4.4	27.5	46.7	19.5	60.5	16.7	-	1
7-14	A12	<0.1	0.4	0.7	3.4	25.1	44.6	25.8	57.0	15.1	-	1
14-21	B21	0.1	0.4	0.6	3.0	25.6	45.4	24.9	57.2	15.9	-	1
21-30	B22	<0.1	0.2	0.4	2.5	23.5	47.0	26.4	56.3	16.0	-	1
30-36	B3	<0.1	0.2	0.3	1.7	23.0	52.7	22.1	57.4	19.6	-	silt
36-47	Csa	<0.1	0.1	0.2a	1.5a	26.2a	56.0	16.0	63.7	19.7	-	silt
47-60	C2	0.1	0.2	0.2a	1.9a	34.3a	49.6	13.7	70.9	14.5	-	1/silt
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	6B1a	MOISTURE TENSIONS			
8C1a		6A1a	6B1a			ESTD SALT (BUREAU CUP)	6A1a	GYPSUM me./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2	
1:1		1:5	1:10	ORGANIC CARBON	NITROGEN	C/N	%	%	%	%	%	
6.1				1.44	0.120	12.0	<0.20	0.7			9.5	
6.7				0.72	0.075	10	<0.20	0.4	Δ		12.0	
7.0				0.65	0.069	9	<0.20	0.4	Δ		11.5	
7.3				0.60	0.072	8	<0.20	0.4	Δ		12.2	
8.0				0.51			<0.20	0.5	3		12.3	
8.1				0.30			<0.20	0.5	5		10.7	
8.2				0.20			<0.20	0.6	7		9.1	
5A1a	EXTRACTABLE CATIONS					5B1a	BASE SAT. % NH ₄ Ac EXCH	SAT. EXT. SOL.		4B4	4A1a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a			6P1a	6Q1a	Field State Water %	Vol. Wts. g/cc	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K			me. per liter -->				
	← milliequivalents per 100g. soil →							← me. per liter -->				
16.6	11.2	2.6	4.8	0.1	2.5	99		0.4	1.7			45.8
19.8	15.2	3.8	2.8	<0.1	1.7	104		0.3	0.6			52.0
19.6	15.4	4.2	2.0	0.1	1.7	109		0.3	0.5	16.3	1.38	54.9
21.7	16.7	5.2	1.6	0.1	2.3	112		0.3	0.8			56.1
21.8			<0.1	0.1	2.8			0.4	1.1			55.9
19.8			<0.1	0.1	3.5			0.5	1.5	14.9	1.34	48.8
16.7			<0.1	0.3	3.4			0.5	1.8			45.5

a. New CaCO₃ concn.

Soil type: Goshen silt loam

Soil No.: S58Nebr-25-2-(1-7)

Location: .15 mile north and 130 feet east of southwest corner Sec. 36, T14N, R45W; approximately 1.5 miles east and 3 miles north of Chappell, Deuel County, Nebraska.

Physiography: Low-lying area in loess-mantled residual uplands.

Relief: Slight.

Slope: Less than 1 percent, plain.

Aspect: Just below footslope position.

Parent material: Loess and alluvium.

Drainage: Well drained.

Permeability: Moderate.

Salt and alkali: None.

Climate: Average annual precipitation 18.5 inches; average annual temperature 49°F.

Land use: Wheat 1958.

Collected by and date: John Elder, W. McKinzie and Robert Jordan, Oct. 23, 1958.

Lincoln

Lab.

No. Horizon

- 9396 Alp 0-7", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak medium and coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
- 9397 A12 7-14", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak medium subangular blocky; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
- 9398 B21 14-21", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; gradual smooth boundary.
- 9399 B22 21-30", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
- 9400 B3 30-36", Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry slightly hard, moist very friable; violent effervescence; gradual smooth boundary.
- 9401 Cca 36-47", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9402 C2 47-60", Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2 moist) silt loam; massive; dry soft, moist very friable; violent effervescence.

NOTE: Large worm casts scattered throughout the profile and very prominent in the B3 horizon. Horizons Alp, B21 and Cca sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY

SOIL TYPE Hall silt loam

Mandan, North Dakota

SOIL NO. 851Nebr-40-11-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
			1B1a											2A2
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02 (19mm)	> 2		
949	0-8	A1p	0.1	0.3	0.6	3.0	23.5	48.3	24.2	12.8	60.6	-	1	
950	8-18	A12	0.1	0.2	0.6	1.6	24.7	46.3	26.5	9.8	62.0	-	1	
951	18-21	AB	0.1	0.2	0.5	1.0	12.1	50.7	35.4	16.1	47.1	-	sic1	
952	21-32	B2	-	0.1	0.3	0.9	8.7	55.2	34.8	19.3	45.1	-	sic1	
953	32-41	B3	0.1	0.4	0.7	2.2	8.9	61.2	26.5	24.5	46.3	-	s11	
954	41-56	C1	0.5	0.5	0.5	1.7	15.9	56.9	24.0	20.9	52.5	-	s11	
955	56-62	C2	0.5	0.4	0.6	1.8	13.7	53.3	29.7	21.3	46.3	1a	sic1	
pH		ORGANIC MATTER				EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	CaCO ₃ equivalent per cent	GYPSUM me./100g SOIL	MOISTURE TENSIONS (per cent) ATMOS.				
SATURATED PASTE	1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N	8A2	6A1a	6E1a	6F1a	1/10	1/3	15		
8C1b	8C1a	8C1a	6A1a									4B2		
5.7	6.0	6.3	2.65			-	1.0	-	-			11.4		
6.2	6.6	6.7	1.55			-	0.6	tr	-			12.2		
6.1	6.5	6.9	1.14			-	0.4	tr	-			22.2		
6.1	6.6	6.7	0.65			-	0.4	tr	-			15.9		
6.5	7.1	7.4	0.29			-	0.4	tr	-			11.3		
6.8	7.4	7.9	0.35			-	0.4	tr	-			18.7		
7.8	8.5	8.6	0.36			-	0.8	-	-			13.4		
5A1a CATION EXCHANGE CAPACITY	5B1a CATIONS EXTRACTABLE				5B1b EXCHANGEABLE	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1					8A PER CENT MOISTURE AT SATURATION		
6N2b	Ca	Mg	Na	K	6P2a	6Q2a	6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄		
meq/100g soil	per 100g soil					PERCENTAGE	milliequivalents per liter							
22.4	12.0	3.7	0.3	2.4	1	1.7	1.8					58.9		
21.5	12.6	4.5	0.3	1.6	1	0.2	0.6					52.5		
22.8	13.4	5.5	0.3	2.1	1	0.2	0.4					52.7		
24.4	14.1	6.4	0.4	2.5	2	0.6	0.6					57.7		
19.1	10.9	5.1	0.5	2.4	3	0.9	0.6					47.1		
29.3	17.9	9.0	1.0	3.8	3	1.5	0.6					57.6		
21.7			1.0	3.4	5	3.9	1.2					47.6		
a. Largely calcareous concretions.														

Soil type: Hall silt loam
 Soil No.: S51Nebr-40-11-(1-7)
 Location: About 900 feet north and 100 feet east of SW corner, Sec. 5, T11N, R11W, Hall County, Nebraska.
 Vegetation: Cultivated, wheat stubble.
 Parent Material: Loess.
 Physiographic position: Terrace.
 Topography: Gentle undulating plain.
 Slope: Less than 1 percent.
 Erosion: None or slight.
 Drainage: Good.
 Moisture: Moist.
 Stoniness: None.
 Described by: B. H. Williams.
 Date: October 10, 1951.

Mandan

Lab. No.	Horizon	Description
949	Alp	0-8 inches. Dark gray (10YR 4.5/1 dry) to very dark brown (10YR 2/2 moist) silt loam; fine soft granular; friable.
950	A12	8-18 inches. Same as above except weak blocky breakage.
951	AB	18-21 inches. This is a kind of B1 in which there is incipient graying along the structure planes as in an A2 horizon. Dark gray (10YR 4/1 dry) to very dark grayish brown (10YR 2.5/2 moist) light silty clay loam; medium to fine blocky-granular.
952	B2	21-32 inches. Grayish brown (2.5Y 5/2 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay loam; medium blocky; slightly hard dry; friable moist; slightly sticky wet.
953	B3	32-41 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) heavy silt loam; weak blocky; friable.
954	C1	41-56 inches. Mixed light and dark silt loam sedimentary layers; marbling through mixing by rodents and insects.
955	C2	56-62 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) silt loam; massive; friable; calcareous. This is a dark sedimentary layer or the A1 of a former weakly developed soil.

Note: This sample is from the same general soil association area of Wood River and Hall soils noted under Profile No. S51-Nebr-40-10-(1-8).

SOIL SURVEY LABORATORY

SOIL TYPE Hall silt loam

Mandan, North Dakota

SOIL NO. S52Nebr-40-2-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									TEXTURAL CLASS	
			1B1a			3A1			2A2 > 2				
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02		
1174	0-5	A1p	---	0.2	0.4	1.8	15.4	58.6	23.6	16.9	58.4	---	sil
1175	5-14	A12	---	0.1	0.3	1.0	13.5	55.8	29.3	16.3	53.7	---	sic1
1176	14-18	A3B1	---	0.1	0.2	0.7	12.0	52.4	34.6	15.5	49.4	---	sic1
1177	18-24	B2	---	---	0.2	0.9	16.9	49.8	32.2	11.5	55.9	---	sic1
1178	24-27	B31	---	---	0.2	1.1	23.6	51.4	23.7	8.7	67.0	---	sil
1179	27-38	B32	---	0.1	0.7	2.2	29.2	50.5	17.3	9.3	71.8	---	sil
1180	38-50	C1	---	---	0.2	11.2	38.1	38.5	12.0	5.3	81.5	---	l
1181	50-52	A1b	---	---	0.2	1.8	13.2	63.1	21.7	22.9	55.0	---	sil
1182	52-60	C1b	---	---	0.2	1.2	13.6	67.7	17.3	17.7	64.3	---	sil
pH			ORGANIC MATTER			EST. SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ⁻³ MILLIMHOS PER CM	CaCO ₃ equivalent per cent	GYPSUM me./100g SOIL	MOISTURE TENSIONS (per cent)			
SATURATED PASTE	1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N	8A2	8A1a	6E1a	6F1a	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
8C1b	8C1a	8C1a	6A1a									4B2	
5.9	6.8	6.9	1.84			---	0.4	tr	---				10.9
5.8	6.7	6.8	1.62			---	0.3	tr	---				13.9
5.9	6.9	7.0	1.22			---	0.2	---	---				16.8
6.0	7.1	7.2	0.72			---	0.2	tr	---				11.8
6.2	7.3	7.4	0.48			---	0.3	---	---				15.7
6.5	7.6	7.7	0.27			---	0.3	tr	---				8.8
6.6	7.6	7.7	0.12			---	0.4	tr	---				6.1
6.5	7.7	7.6	0.20			---	0.4	tr	---				11.2
6.6	7.7	7.8	0.14			---	0.4	---	---				10.0
5A1a	5B1a	CATIONS			5B1b	5D2	SATURATION EXTRACT SOLUBLE					8A	
EXCHANGE CAPACITY	EXTRACTABLE		EXCHANGEABLE		EXCHANGEABLE SODIUM PERCENTAGE ESP	6P1a	6Q1a	CO ₃	HCO ₃	Cl	SO ₄	PER CENT MOISTURE AT SATURATION	
meq/100g	Ca	Mg	Na	K		Na	K	milliequivalents per liter					
6N2b	6O2b	6P2a	6Q2a										
21.3	13.2	4.4	0.1	1.7	---	0.2	0.8					40.2	
23.7	15.3	4.5	0.1	0.8	---	0.2	---					52.5	
26.5	17.3	5.2	0.3	0.9	1	0.2	0.2					59.6	
24.9	16.4	6.0	0.3	1.3	1	0.2	0.2					61.0	
19.6	12.9	4.7	0.3	1.1	2	0.2	0.2					52.5	
15.6	10.4	3.7	0.1	1.2	1	0.2	0.5					46.5	
11.0	7.7	2.8	0.3	1.0	3	0.6	0.8					38.7	
20.1	13.6	4.2	0.3	2.0	1	0.2	0.8					46.8	
18.4	12.7	3.8	0.3	2.1	2	0.6	0.8					45.5	

Soil type: Hall silt loam

Soil No.: S52Nebr-40-2-(1-9)

Date: September 1952

County: Hall County, Nebraska.

Location: NE1/4 of NE1/4 Sec. 9, T10N, R11W, about 700 feet south and 100 feet west of northeast corner of section.

Described by: B. H. Williams.

Mandan

Lab. No. Horizon

- 1174 A1p 0-5 inches. Very dark gray (10YR 3/1 moist) to gray (10YR 5/1 dry) friable, granular silt loam.
- 1175 A12 5-14 inches. Very dark brown (10YR 2/2 moist) to dark gray (10YR 4/1 dry) silt loam; breaks out in large irregular blocks but crushes easily; slightly moist to medium granules.
- 1176 A3B1 14-18 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) coarse granular to weak subangular blocky, friable, heavy silt loam.
- 1177 B2 18-24 inches. Dark grayish brown (10YR 3.5/2 moist) to grayish brown (10YR 5/1.5 dry) silty clay loam (probably on light side); medium blocky but crushes to fine blocks and coarse granules.
- 1178 B31 24-27 inches. Brown (10YR 5/3 moist) to pale brown (10YR 6/3 dry) blocky, friable, silt loam.
- 1179 B32 27-38 inches. Dark brown (10YR 4/3 moist) to pale brown (10YR 6/3 dry) weak blocky light silt loam or very fine sandy loam; soft, friable, moist.
- 1180 C1 38-50 inches. Grayish brown (2.5Y 6/2 moist) to light brownish gray (2.5Y 6/2 dry) massive, friable, very fine sandy loam.
- 1181 A1b 50-52 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6.5/2 dry) weak blocky, friable, silt loam, high in coarse silt or very fine sand.
- 1182 C1b 52-60 inches. Grayish brown (2.5Y 5/2 moist) to light gray (2.5Y 7/2 dry) massive, friable, silt loam or very fine sandy loam.
- 60+ inches. A heavy silt loam, same color as above horizon. No free lime carbonate to 64 inches.

Note: Coarse sand substratum is found at depth of 5 to 7 feet in this general area.

SOIL TYPE Hastings LOCATION Adams County, Nebraska
 silt loam

SOIL NOS. S59Nebr-1-1 LAB. NOS. 11202-11213

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS		
		1B1a		COARSE SAND		MEDIUM SAND		FINE SAND		VERY FINE SAND			2A2	
		VERY COARSE SAND	COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	CLAY	CLAY		> 2	(19mm)
0-5	A1p	-	-	Tr.	0.3	13.3	62.8	23.6	60.1	16.2	-	sil		
5-9	A12	-	-	Tr.	0.2	11.6	56.4	31.8	50.9	17.2	-	sic1		
9-12	B1	-	-	Tr.	0.3	9.2	52.2	38.3	46.0	15.6	-	sic1		
12-20	B21	-	-	Tr.	0.2	7.9	50.1	41.8	40.7	17.5	-	sic		
20-26	B22	-	-	Tr.	0.1	6.4	56.9	36.6	45.1	18.2	-	sic1		
26-32	B3	-	-	0.1	0.5	7.8	62.0	29.6	51.0	19.1	-	sic1		
32-43	Cca1	0.1b	0.1b	0.1b	0.7a	8.7a	69.6	20.7	54.1	24.7	Tr.	sil		
43-53	Cca2	0.1b	0.2b	0.2b	0.8a	8.5a	68.2	22.0	53.8	23.4	Tr.	sil		
53-62+	C1	0.1b	0.2b	0.2b	0.7a	8.1a	69.6	21.1	53.6	24.6	Tr.	sil		
69-84	C2	Tr.	0.1b	0.1b	0.6a	6.4a	69.6	23.2	53.5	22.9	-	sil		
8C1a	6C1a	Organic Matter					Bulk Density			Moisture Retention				
pH	Ext. Iron as Fe	6A1a	6B1a	Field Moist		30 Cm.		4Alh O.D.		4B2 15-Atm. Sieved				
1:1	%	O.C.	N	C/N		% M.	g/cc	% M.	g/cc	%				
6.2	0.4	1.37	0.112	12						10.0				
6.8	0.6	1.25	0.113	11					1.43	13.6				
6.8	0.6	0.96	0.092	10					1.52	16.2				
7.2	0.6	0.63	0.064	10					1.67	18.0				
7.2	0.5	0.39	0.048	8					1.66	15.9				
7.8	0.4	0.26	0.040	6					1.49	13.5				
8.1	0.4	0.17	0.027						1.44	12.0				
8.3	0.4	0.13	0.021						1.48	11.5				
8.2	0.5	0.14	0.021						1.43	11.4				
8.2	0.5	0.14	0.022						1.43	11.5				
5A1a	6N2b	EXTRACTABLE CATIONS 5B1a				Base Sat.		8D1		Carbonate as CaCO3				
CATION EXCHANGE CAPACITY NH4OAc	Co	6O2b Mg	6H1a H	6P2a Na	6Q2a K	on		Ratios to Clay		Whole Sample		Clay-Size % 6E1c		
						NH4OAc Exch. %	on Sum Bases plus H % 5C3	15-Atm. Moist	Cat. Exch. Cap.	Iron % 6E1a	Clay-Size % 6E1c			
18.7	12.2	3.8	4.7	0.1	1.2	92	79	.42	0.79	.02	-	-		
22.7	15.9	5.3	4.3	0.1	1.3	100	84	.43	0.71	.02	-	-		
25.6	17.6	6.5	3.5	0.2	1.6	101	88	.42	0.67	.02	-	-		
28.8	19.1	7.8	3.0	0.4	2.1	102	91	.43	0.69	.01	-	-		
27.3	18.5	7.8	2.3	0.5	2.4	107	93	.43	0.74	.01	-	-		
25.4		7.3	0.8	0.6	2.4		97	.46	0.86	.01	Tr.	-		
23.0		7.3	-	0.8	2.5		100	.58	1.11	.02	2	-		
23.1		6.8	-	1.2	2.5		100	.52	1.05	.02	1	-		
23.0		5.6	-	1.4	2.4		100	.54	1.09	.02	1	-		
21.8		5.9	0.8	1.6	2.3		97	.50	0.94	.02	Tr.	-		

a. Few carbonate nodules.
 b. Common carbonate nodules.

Soil type: Hastings silt loam
 Soil No.: 859Nebr-1-1
 Location: 175 feet south and 130 feet east of northwest corner Sec. 15, T6N, R11W, Adams County, Nebraska.
 Elevation: 1,980 feet.
 Climate: Subhumid; average annual precipitation 24.6 inches; average annual temperature 51° F.
 Crop: Wheat, 1958; summer fallow, 1959.
 Parent material: Peorian loess.
 Physiography: Upland plain.
 Relief: Nearly level.
 Slope: Less than 1 percent southeast.
 Erosion: Slight.
 Drainage: Moderately slow.
 Ground water: Deep.
 Permeability: Moderately slow.
 Moisture: Moist to 5 feet.
 Salt or alkali: None.
 Stoniness: None.
 Root distribution: No restrictive zone.
 Date: June 17, 1959.

Described by: Ross Greenawalt.

Horizon and
 Lincoln
 Lab. Number

A1p 11202	0 to 5 inches. Dark grayish brown (10YR 4/2 dry), very dark brown (10YR 2/2 moist), and very dark brown (10YR 2.5/2 moist crushed) silt loam; coarse clods breaking to weak very fine granular structure; slightly hard, dry; friable, moist; noncalcareous; abrupt smooth boundary.
A12 11203	5 to 9 inches. Very dark grayish brown (10YR 3.5/2 dry), very dark gray (10YR 3/1 moist), and very dark grayish brown (10YR 3/2 moist crushed) heavy silt loam; weak medium and coarse angular blocky breaking to moderate fine and very fine granular structure; slightly hard, dry; friable, moist; noncalcareous; clear, smooth boundary.
B1 11204	9 to 12 inches. Dark grayish brown (10YR 4/2 dry), very dark grayish brown (10YR 3/2 moist), and very dark grayish brown (10YR 3.5/2 moist crushed) silty clay loam; moderate fine subangular blocky structure; thin discontinuous clay films; hard, dry; firm, moist; noncalcareous; clear smooth boundary.
B21 11205	12 to 20 inches. Grayish brown (10YR 5/2.5 dry), dark brown (10YR 3/3 moist), and olive brown (2.5Y 4/3 moist crushed) heavy silty clay loam; moderate fine and medium subangular blocky; thin continuous clay films; hard, dry; firm, moist; noncalcareous; gradual smooth boundary.
B22 11206	20 to 26 inches. Brown (10YR 5/3 dry), dark brown (10YR 4/3 moist), and olive brown (2.5Y 4/4 moist crushed) heavy silty clay loam; moderate medium blocky structure; thin continuous clay films; hard, dry; firm, moist; noncalcareous; gradual smooth boundary.
B3 11207	26 to 32 inches. Pale brown (10YR 6/3 dry), yellowish brown (10YR 5/4 moist), and grayish brown (10YR 5/2.5 moist crushed), few faint fine strong brown mottles, heavy silt loam; weak coarse and medium angular blocky structure; hard, dry; friable, moist; noncalcareous, however, a few soft line segregations are present in the lower inch; gradual smooth boundary.
Cca1 11208	32 to 43 inches. Light gray (10YR 7/2 dry), light olive brown (2.5Y 5/4 moist), and olive brown (2.5Y 4.5/4 moist crushed), few distinct fine dark brown mottles, silt loam; weak coarse angular blocky structure; slightly hard, dry; friable, moist; strong effervescence; (lime mostly as small soft segregations); clear wavy boundary.
Cca2 11209	43 to 53 inches. Light gray (10YR 7/2 dry), light olive brown (2.5Y 5/3 moist), and brown (10YR 5/3 moist crushed), few distinct fine brown mottles, silt loam; weak coarse prismatic with weak fine platy secondary structure; slightly hard, dry; friable, moist; strong effervescence; (lime disseminated and on faces of peds); gradual smooth boundary.
C1 11210	53 to 62+ inches. Light gray (2.5Y 7/2 dry), grayish brown (2.5Y 5/2 moist), and light olive brown (2.5Y 5/3 moist crushed) silt loam; weak coarse prismatic with fine platy secondary structure; slightly hard, dry; friable, moist; strong effervescence; (lime disseminated and on faces of peds); gradual smooth boundary.
C2 11211	69 to 84 inches. Light gray (10YR 7/2 dry), yellowish brown (10YR 5.5/4 moist), and brown (10YR 5/3 moist crushed) silt loam; slightly hard, dry; friable, moist; slight effervescence.

Note: Numerous fine and very fine pores from 20 to 62 inches. Samples 69 to 120 inches taken with orchard auger. In deep cuts, the lower horizons have weak coarse prismatic structure. The very fine sands include approximately 50 percent quartz, 20 percent identified feldspar, and 15 percent highly altered grains. Glass shards increase from 5 percent in the solum to 15 percent in the C horizons. The pattern of feldspar alteration changes little with depth. Many of the identified feldspar grains, also somewhat altered, are probably albite. Accessory minerals in order of decreasing abundance are chlorite(?), which increases with depth, amphibole, epidote, and plant opal (restricted to upper horizons largely). (Method 7B1) This profile description used in Guide for Tour III, Seventh Congress of the International Society of Soil Science, August 1960.

SOIL TYPE Hastings LOCATION Adams County, Nebraska
silt loam

SOIL NOS. S61Nebr-1-1 LAB. NOS. 15723-15731

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
		1B1a		PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1					2A2		TEXTURAL CLASS	
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2	< 0.002		
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	< 19mm			
0-6	Alp	-	-	0.1	0.4	8.6	67.0	23.9	55.7	20.2	-	sil
6-9	A12	-	-	0.1	0.3	7.2	64.4	27.9	51.3	20.5	-	sic1
9-11	B1	-	-	Tr.	0.6	6.1	58.2	35.1	44.0	20.5	-	sic1
11-20	B21	-	-	0.1	0.1	5.7	48.6	45.5	37.1	17.3	-	sic
20-25	B22	-	-	0.1	0.3	7.7	56.5	35.4	44.4	20.0	Tr. c	sic1
25-35	B3	-	-	0.1	0.5	8.2	62.5	28.7	46.8	24.0	Tr. c	sic1
35-46	C1	0.6b	0.3b	0.2b	0.6a	8.8a	72.0	17.5	52.0	29.2	Tr. c	sil
46-56	C2	0.1b	0.1b	0.2b	0.8a	8.8a	73.3	16.7	53.8	28.7	Tr. c	sil
56-72	C3	Tr.	Tr.	0.1b	0.5a	8.6a	70.3	20.5	54.0	25.2	Tr. c	sil
8C1a	6C1a	Organic Matter					Bulk Density			Moisture Retention		
pH	Ext. Iron as Fe	6A1a	6B1a	C/N	Field Moist		30 Cm.		A.D.	4B1b	4B2	
		O.C.	N		% M.	g/cc	% M.	g/cc	g/cc	1/3-Atm. Pieces	15-Atm. Sieved	
1:1	%	%	%						%	%		
5.8	0.5	1.36	0.115	12					21.2	9.8		
6.1	0.6	1.21	0.115	10					25.4	11.8		
6.3	0.6	0.95	0.096	10						14.6		
6.6	0.7	0.59	0.064	9					31.7	20.5		
6.9	0.6	0.34	0.041	8					28.1	16.5		
7.2	0.6	0.22							26.4	14.0		
7.8	0.6	0.14							25.6	11.6		
7.9	0.6	0.09							28.9	11.6		
7.9	0.6	0.10							29.3	11.6		
5A1a	EXTRACTABLE CATIONS 5B1a					Base Sat.	8D1			Carbonate as CaCO3		
CATION EXCHANGE CAPACITY NH4OAc	6N2b	6O2b	6H1a	6P2a	6Q2a	on	on Sum	Ratios to Clay		Whole Sample % 6E1b	Clay-Size % 6E1c	
	Ca	Mg	H	Na	K	NH4OAc	Bases plus H	15-Atm. Moist.	Cat. Exch. Cap.			Iron
	mequiv. per 100g. soil					Exch. % 5C1	% 5C3					
17.0	11.0	3.7	5.2	0.1	1.5	96	76	.42	0.72	.02		
18.6	12.4	4.3	6.3	0.1	1.6	99	74	.42	0.67	.02		
21.5	14.7	5.8	5.8	0.1	1.6	103	79	.42	0.61	.02		
29.0	19.4	8.6	6.4	0.2	2.3	105	83	.45	0.64	.02		
26.6	17.1	8.1	3.5	0.3	2.3	104	89	.46	0.75	.02		
24.7	17.0	7.3	3.8	0.4	2.4	110	88	.49	0.86	.02		
21.6				0.6	2.4			.66	1.23	.03	2	
21.3				0.8	2.4			.69	1.28	.04	1	
21.7				1.1	2.3			.56	1.06	.03	Tr.	

a. Few carbonate nodules.
 b. Common carbonate nodules.
 c. Carbonate.

Soil type: Hastings silt loam
 Soil No.: S61Nebr-1-1
 Location: 150 feet east and 150 feet north of S1/4 corner Sec. 23, T6N, R11W, Adams County, Nebraska.
 Topography: Nearly level, less than 1/2 percent slope.
 Crop: Fallow ground the summer of 1961. Described by: Herbert L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

A1p
 15723 0 to 6 inches. Very dark brown (10YR 2/2 moist) silt loam. Weak fine crumb; very friable moist; abrupt smooth boundary. Color was somewhat splotchy and had some 10YR 3/1 mixed with 2/2 in matrix.

A12
 15724 6 to 9 inches. Very dark brown (10YR 2/2 moist) silty clay loam. Moderate medium and fine granular; friable moist; clear smooth boundary.

B1
 15725 9 to 11 inches. Very dark brown (10YR 2/2 moist) silty clay loam. Moderate fine and very fine sub-angular blocky; friable moist; clear smooth boundary.

B21
 15726 11 to 20 inches. Dark brown (10YR 3/3 moist) heavy silty clay loam or silty clay. Moderate medium and fine prismatic to moderate or strong medium and fine angular blocky; firm moist; clear wavy boundary; continuous clay skins. Organic stainings on cleavage planes; some dark fill in small channels or cracks.

B22
 15727 20 to 25 inches. Dark grayish brown (10YR 4/2 moist) silty clay loam. Moderate medium and fine prismatic to weak coarse and medium subangular blocky; firm, moist; clear wavy boundary; thin and patchy clay skins. Dark organic stainings on cleavage planes; some dark fill in cracks and old channels.

B3
 15728 25 to 35 inches. Brown (10YR 5/3 moist) light silty clay loam. Weak coarse subangular blocky; friable moist but somewhat brittle as it crushes; abrupt wavy boundary; some worm casts and pores; few common distinct dark brown mottles.

C1
 15729 35 to 46 inches. Light brownish gray to pale brown (10YR 6/2.5 moist) silt loam. Massive; friable moist but somewhat brittle as it crushes; violent effervescence. This horizon split from C2 for sampling so no lower boundary indicated. Many fine pores and open root channels. Concentration of CaCO₃ on cleavage planes and in the former root channels; few fine faint dark brown mottles.

C2
 15730 46 to 56 inches. This horizon was divided from C1 only for sampling; all characteristics and features continue the same from 35 to 56 inches of depth. Gradual wavy boundary at 56 inches.

C3
 15731 56 to 72 inches. Pale brown (10YR 6/3 moist) silt loam. Massive; very friable moist; strong effervescence; free lime visible in old root channels. Many fine pores in matrix; few fine faint yellowish brown mottles and numerous fine dark brown mottles; matrix has a somewhat brittle feel when being crushed.

Remarks: The very fine sands include approximately 50 percent quartz, 20 percent identified feldspar, and 15 percent highly altered grains. Glass shards increase from 5 percent in the solum to 15 percent in the C horizons. The pattern of feldspar alteration changes little with depth. Many of the identified feldspar grains, also somewhat altered, are probably albite. Accessory minerals in order of decreasing abundance are chlorite(?), which increases with depth, amphibole, epidote, and plant opal (restricted to upper horizons largely). (Method 7Bi)

SOIL TYPE Hastings LOCATION Clay County, Nebraska
silt loam

SOIL NOS. S54Nebr-18-1-(1-8) LAB. NOS. 2358-2365

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1b					3A1						2A2 > 2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002			
0-6	A1p	0.1b	0.1	0.1	0.3	15.0	59.3	25.1	57.5	16.9	-	sil	
6-9	A12	-	-	0.1	0.2	9.1	57.1	33.5	48.0	18.3	-	sic1	
9-12	B1	-	-	0.2	0.1	9.0	54.0	36.7	42.9	20.1	-	sic1	
12-24	B21	-	-	-	0.1	7.3	53.4	39.2	38.9	21.8	-	sic1	
24-33	B22	-	-	0.1	0.2	7.3	55.4	37.0	38.1	24.7	-	sic1	
33-38	B3	-	-	0.2	0.3	9.8	57.7	32.0	42.7	24.9	-	sic1	
38-48	C	-	0.1	0.1	0.3	10.7	62.5	26.3	47.4	26.0	-	sil	
48-60	Cca	-	0.4	0.2	0.4	13.5	62.8	22.7	48.7	27.8	-	sil	

ACID SATURATED PASTE	pH		ORGANIC MATTER			ESTM. SALT (BUREAU CUP)	ELECTRI-CAL CONDUCTIVITY EC-10 ³ MILLIMHS PER CM	6E1a CoCO ₂ equiv- alent	GYPSUM mo./100g. SOIL	MOISTURE TENSIONS		
	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
5.8	6.4	6.5	1.53	.140	10.9							10.4
6.0	6.9	6.9	1.47	.143	10.3							14.3
6.1	7.0	7.0	1.15	.115	10.0							15.5
6.1	7.1	7.1	0.60	.071	8.4							17.0
6.3	7.5	7.5	0.32									17.7
6.5	7.6	7.7	0.20									15.8
6.8	7.7	7.8	0.13									14.1
7.5	8.6	8.7	0.10									13.9

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. %	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	6M2b Ca	6O2b Mg	6P2a H	6Q2a Na	6Q2a K				
	milliequivalents per 100g. soil								
19.3	11.5	3.9		0.1	2.0	91	17.5	2.9	
24.1	14.9	5.0		0.1	2.0	91	22.0	3.0	
24.7	15.4	5.6		0.1	1.8	93	22.9	2.8	
26.9	17.6	6.9		0.2	1.4	97	2.61	2.6	
28.1	19.2	7.8		0.3	1.6	100	2.89	2.5	
27.2	19.0	7.4		0.3	1.6	100	2.83	2.6	
25.4	18.3	7.0		0.4	1.6	100	2.73	2.6	
25.7	23.1	7.1		0.4	1.7	100	3.23	3.2	

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Hastings silt loam
 Soil No.: S54Nebr-18-1-(1-8)
 Location: 1160 feet west and 100 feet south of northeast corner Sec. 19, T8N, R5W, Clay County, Nebraska.
 Topography: East-northeast facing slope of about 2 percent in an undulating loess-mantled plain.
 Land use: Cultivated, fallow 1954.
 Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- 2358 A_{1p} 0-6" Grayish brown (10YR 5/2, dry) to very dark grayish brown (10YR 2.5/2, moist) silt loam, moderate fine granular structure but breaks up somewhat cloddy when tilled dry; slightly hard, dry; friable, moist; abrupt smooth lower boundary.
- 2359 A₁₂ 6-9" Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2/2, moist) silt loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
- 2360 B₁ 9-12" Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) silty clay loam; weak coarse prismatic vertical cleavage with prisms separating easily to strong fine blocks; slightly hard, dry; friable, moist. Clear smooth lower boundary.
- 2361 B₂₁ 12-24" Grayish brown (10YR 5/2.5, dry) to dark brown (10YR 4/3, moist) heavy silty clay loam; compound moderate medium prismatic and strong fine blocky structure; hard, dry; firm, moist; moderate glaze on surfaces of blocks; some dark organic staining along vertical cleavage planes.
- 2362 B₂₂ 24-33" Pale brown (10YR 6.5/3, dry) to brown (10YR 5/3, moist) heavy silty clay loam; compound moderate medium prismatic and strong medium and fine blocky structure; hard, dry; firm, moist; slightly glazing on faces of blocks and some dark organic staining along vertical cleavage planes; gradual smooth lower boundary.
- 2363 B₃ 33-38" Very pale brown (10YR 7/3, dry) to brown (10YR 5.5/3, moist) silty clay loam; moderate medium and coarse blocky structure with slight glaze on structure faces; slightly hard, dry; friable, moist; gradual smooth lower boundary.
- 2364 C 38-48" Very pale brown (10YR 7/3, dry) to light yellowish brown (2.5Y 5.5/4, moist) silt loam; common faint and prominent gray, yellow and strong brown streaks and mottles; massive or weak coarse subangular blocky structure; slightly hard, dry; friable, moist; numerous thread-like channels and pores; clear wavy lower boundary.
- 2365 C_{ca} 48-60" Pale yellow (2.5Y 8/4, dry) to light yellowish brown (2.5Y 6/4, moist) silt loam; few faint and prominent fine mottlings and prominent strong brown and dark brown streaks and bands; massive; soft, dry; friable, moist; calcareous, strong effervescence on white lime accumulation, weak or no reaction in some places where no accumulation is visible; pores and root channels numerous.

SOIL TYPE Hastings silt loam LOCATION Clay County, Nebraska

SOIL NOS. S54Nebr-18-2-(1-8) LAB. NOS. 2366-2373

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1A1b		3A1				2A2				
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY				
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.7-0.07	0.02-0.002				
0-6	alp	-	0.1b	0.3	0.5	15.7	59.1	24.3	57.2	17.9	-	sil
6-10	al2	-	-	0.1b	0.2	9.5	57.8	32.4	46.8	20.6	-	sicl
10-15	B1	-	-	0.2	0.3	9.2	53.7	33.6	40.9	22.1	-	sicl
15-21	B21	-	-	-	0.1	6.9	55.6	37.4	38.3	24.2	-	sicl
21-31	B22	-	0.1b	0.1	0.1	7.5	56.0	36.2	39.2	24.3	-	sicl
31-39	B3	-	0.1b	0.1	0.2	11.2	55.4	33.0	43.4	23.3	-	sicl
39-47	C	0.1b	0.1	0.1	0.2	10.4	63.0	26.1	44.6	23.9	-	sil
47-60	Cca	0.2	0.1	0.1	0.2	9.7	64.8	24.9	44.2	30.4	-	sil

8C1b SATURATED PASTE	pH		ORGANIC MATTER			ESTM. SALT (BUROAU CLP)	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMOS PER CM	6E1a CoCO ₂ equivalent	GYPSUM no./100g. SOIL	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	4B2							
	1:5	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N					1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
5.6	6.3	6.4	1.48	.131	11.3							9.5
6.1	7.0	7.1	1.16	.116	10.0							13.7
6.3	7.2	7.3	0.75	.087	8.6							15.7
6.3	7.3	7.5	0.52	.066	7.9							16.7
6.4	7.6	7.7	0.34	.052	6.5							17.0
6.8	7.9	8.0	0.24									16.6
7.1	8.1	8.3	0.16									15.1
7.9	8.8	9.0	0.11									13.8

5A1a CATION EXCHANGE CAPACITY NH ₄ , Ac	EXTRACTABLE CATIONS					BASE SAT. %	5A1a Sum Cations me/100g	5B3 Ca/Mg	MOISTURE AT SATURATION %
	6A2b		6B2a						
	Ca	Mg	H	Na	K				
18.7	11.1	3.4		0.1	1.5	86	16.1	3.3	
22.9	14.9	4.7		0.1	1.1	91	20.8	3.2	
24.7	15.9	5.5		0.2	1.3	93	22.9	2.9	
25.1	16.6	6.0		0.3	1.5	97	24.4	2.8	
26.5	18.3	7.1		0.6	1.9	100	27.9	2.6	
25.3	20.0	7.6		0.8	2.1	100	30.5	2.6	
26.9	19.7	7.4		0.8	2.1	100	30.0	2.7	
28.2		7.3		1.1	2.1				

a. Particle size analyses by Beltsville Laboratory.
 b. Organic matter in sand fractions.

Soil type: Hastings silt loam
 Soil No.: S54Nebr-18-2-(1-3)
 Location: .2 mile south and 300 feet west of northeast corner Sec. 24, T6N,
 R7W, Clay County, Nebraska.
 Topography: On 2 percent east facing slope of undulating loess-mantled plain,
 but only 200 to 300 feet back (west) from a steep slope breaking
 to lower ground.
 Land use: Cultivated, sorghum 1954.
 Described by: B. E. Williams.

Mandan
 Lab.

No. Horizon Depth

- 2366 A_{1p} 0-6" Dark grayish brown (10YR 4.5/1.5, dry) to very dark grayish brown (10YR 2.5/2, moist) silt loam; moderate fine granular structure; soft, dry; friable, moist; in tillage when dry breaks to medium and coarse blocky clods with slightly hard dry consistence; abrupt smooth lower boundary.
- 2367 A₁₂ 6-10" Dark grayish brown (10YR 4/1.5, dry) to very dark grayish brown (10YR 2.5/2, moist) silt loam; strong fine granular structure; soft, dry; friable, moist. When spaded up in nearly dry condition, the soil falls apart in large blocky clods, breaking along vertical cracking planes; clear smooth lower boundary.
- 2368 B₁ 10-15" Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) light silty clay loam; compound weak coarse prismatic and strong fine blocky structure; slightly hard, dry; friable, moist; plant roots abundant; clear smooth lower boundary.
- 2369 B₂₁ 15-21" Grayish brown (10YR 5/2.5, dry) dark grayish brown (10YR 4/2, moist) heavy silty clay loam; compound moderate coarse prismatic and strong medium and fine blocky structure; hard, dry; firm, moist; some dark brown staining along vertical cracking planes; gradual smooth lower boundary.
- 2370 B₂₂ 21-31" Pale brown (10YR 6/3, dry) to brown (10YR 5/3, moist) silty clay loam; compound moderate medium and coarse prismatic and strong medium and fine blocky structure; dark brown staining along some of the vertical cracking planes; hard, dry; firm, moist; a fair number of living roots and numerous dead ones; clear smooth lower boundary.
- 2371 B₃ 31-39" Pale brown (10YR 6/3, dry) to brown (10YR 5/2.5, moist) heavy silt loam or silty clay loam; few faint fine brown mottles; moderate medium and coarse blocky with some well-defined vertical cracking planes to give, in effect, very coarse (6- to 12-inch) prisms, slightly hard, dry; friable, moist; few or no living roots; clear smooth boundary.
- 2372 C 39-47" Very pale brown or light gray (10YR 7/2.5, dry) to light olive brown (2.5Y 5/4, moist) silt loam; common prominent and faint yellow, brown and strong brown mottles; weak medium and fine blocky or subangular blocky structure; slightly hard, dry; friable, moist; numerous pores and root channels; clear smooth lower boundary.
- 2373 C_{ca} 47-60" Very pale brown (10YR 7/3, dry) to light yellowish brown (2.5Y 5.5/4, moist) silt loam; common prominent yellow and strong brown mottles; massive; soft, dry; friable, moist; calcareous, including spots, threads and seams of accumulated lime; a few pores and root channels.

Horizons A_{1p}, A₁₂, B₂₁, B₂₂, and C_{ca} sampled for Bureau of Public Roads.

SOIL TYPE Hastings LOCATION York County, Nebraska
silt loam

SOIL NOS. S54Nebr-93-1-(1-7) LAB. NOS. 2344-2350

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									2A2 > 2	TEXTURAL CLASS
		1B1b		3A1								
		VERY COARSE SAND 2-1	COARSE SAND 1.0-5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002		
0-6	Alp	0.1	0.2	0.2	0.6	9.6	64.1	25.2	54.1	19.8	-	sil
6-15	Al2	-	-	0.4	0.4	7.6	56.6	32.6	44.4	22.1	-	sic1
15-20	B1	-	-	0.1	0.1	7.1	56.0	36.7	37.9	25.2	-	sic1
20-29	B21	-	-	-	0.6	6.5	54.3	33.6	39.2	21.8	-	sic1
29-37	B22	-	-	0.1	0.2	8.7	54.7	36.3	41.5	22.0	-	sic1
37-48	B3	-	-	0.3	0.5	8.3	58.3	32.6	43.9	22.9	-	sic1
48-60	C	-	0.1	-	0.2	11.6	60.7	27.4	48.0	24.4	-	sic1

8C1b SATURATED PASTE	pH		ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRI- CAL CONDUCT- IVITY EC-10 ³ MILLIMHOS PER CM	O1a		MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	C/N			CoCO ₂ equiv- alent	GYPSUM no./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	% ORGANIC CARBON	% NITRO- GEN								
5.5	5.9	6.2	1.81	.166	10.9	-	-	-	-	-	9.9	
5.7	6.4	6.5	1.47	.141	10.4	-	-	-	-	-	13.3	
5.7	6.5	6.8	0.94	.095	9.9	-	-	-	-	-	15.1	
5.9	6.6	6.9	0.55	.066	8.3	-	-	-	-	-	16.4	
6.1	6.8	7.3	0.29	-	-	-	-	-	-	-	16.6	
6.3	7.3	7.4	0.18	-	-	-	-	-	-	-	15.2	
6.5	7.3	7.7	0.08	-	-	-	-	-	-	-	13.9	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. %	No	K	5A3a Sum Cati- ons me/100g	8D3 Ca/Mg	MOISTURE AT SATU- RATION %
	5N2b	6O2b	6P2a		6Q2a						
	Ca	Mg	H	No	K						
19.7	10.9	3.3	-		2.0	82	-	-	16.2	3.3	-
22.4	13.7	4.7	0.1		0.8	86	-	-	19.3	3.0	-
24.6	13.5	5.8	0.1		0.6	81	-	-	20.0	2.3	-
26.1	16.8	7.0	0.2		0.8	95	-	-	24.8	2.4	-
26.9	18.1	7.7	0.3		1.2	100	-	-	27.3	2.4	-
27.1	18.2	7.4	0.3		1.4	100	-	-	27.3	2.4	-
25.8	17.6	7.0	0.4		1.5	100	-	-	26.5	2.5	-

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Hastings silt loam
 Soil No.: S54Nebr-93-1-(1-7)
 Location: 150 feet south and 80 feet west of northeast corner Sec. 4, T10N,
 R2W, York County, Nebraska.
 Topography: West facing 1 to 2 percent slope in gently undulating loess-
 mantled plain.
 Land use: Cultivated, corn 1954.
 Described by: B. H. Williams.

Mandan
 Lab.

No.	Horizon	Depth	
2344	A _{1p}	0-6"	Grayish brown (10YR 4.5/2, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; fine granular structure; slightly hard and blocky or cloddy, dry; friable, moist; abrupt smooth lower boundary.
2345	A ₁₂	6-15"	Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) heavy silt loam; weak coarse blocky separating to moderate or strong fine granular structure; slightly hard, dry; friable, moist; gradual smooth lower boundary.
2346	B ₁	15-20"	Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) silty clay loam; weak coarse prismatic separating to strong fine and very fine blocky structure; faces of blocks slightly darker than interiors; hard, dry; firm, moist; gradual smooth lower boundary.
2347	B ₂₁	20-29"	Grayish brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) heavy silty clay loam or silty clay; weak coarse prisms separating easily into strong medium and coarse blocky structure; hard, dry; firm, moist; moderate glaze on blocks; gradual smooth lower boundary.
2348	B ₂₂	29-37"	Brown (10YR 5.5/3, dry) to light olive brown (2.5Y 5/3 moist) heavy silty clay loam; strong medium and coarse blocky structure, with moderate glaze on faces of blocks; hard, dry; firm, moist; gradual smooth lower boundary.
2349	B ₃	37-48"	Pale brown (10YR 6/3, dry) to light olive brown (2.5Y 5/4, moist) silty clay loam; moderate medium blocky structure with slight glaze on faces of peds; slightly hard, dry; friable, moist; old root channels and a few live corn roots; gradual smooth lower boundary.
2350	C	48-60"	Pale brown (10YR 6.5/3, dry) to light olive brown (2.5Y 5/4 moist) heavy silt loam; massive; soft, dry; friable, moist; numerous faint fine pores or tube-like channels; no effervescence with dilute HCl.

Horizons A_{1p}, A₁₂, B₂₁, B₂₂ and C sampled for Bureau of Public Roads.

OIL TYPE Hastings LOCATION York County, Nebraska
silt loam

SOIL NOS. S54Nebr-93-2-(1-7) LAB. NOS. 2351-2357

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1b 3A1										
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002				
0-5	Alp	-	0.6	0.5	0.9	12.5	61.3	24.2	51.4	19.8	-	sil
5-16	Al2	-	-	0.1	0.2	8.4	57.9	33.4	45.1	21.3	-	sic1
16-21	B1	-	-	0.3	0.4	6.4	53.9	39.0	38.9	21.6	-	sic1
21-32	B21	-	-	0.1	0.2	8.1	52.8	38.3	40.3	20.7	-	sic1
32-42	B22	-	-	0.1	0.2	8.8	56.3	34.6	44.3	20.9	-	sic1
42-51	B3	-	-	0.4	0.3	10.7	59.5	29.1	46.7	23.6	-	sic1
51-60	C	-	0.2	-	0.4	15.5	59.7	24.2	55.6	25.8	-	sil

8C1b SATURATED PASTE	pH		ORGANIC MATTER			ELECTRI- CAL CONDUCTI- VITY EC-10 ³ MILLIMHOS PER CM	MOISTURE TENSIONS				
	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO- GEN %	C/N		6E1a CoCO ₃ equiv- alent %	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
5.6	6.1	6.3	1.92	.157	12.2	-	-	-	-	9.5	
5.9	6.5	6.7	1.51	.140	10.8	-	-	-	-	13.7	
5.9	6.8	6.8	0.79	.088	9.0	-	-	-	-	15.7	
6.2	7.0	7.3	0.58	.051	7.4	-	-	-	-	16.4	
6.3	7.3	7.5	0.22			-	-	-	-	15.9	
6.5	7.6	7.7	0.14			-	-	-	-	14.2	
6.8	7.8	7.8	0.12			-	-	-	-	13.5	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5A1a					BASE SAT. %	5A3a Sum Cat- ions me/100g	8D3 Ca/Mg	MOISTURE AT SATU- RATION %
	6N2b Ca	6O2b Mg	6P2a						
			H	Na	K				
19.2	10.6	3.0		0.1	1.8	81	15.5	3.5	
23.7	14.6	4.8		0.1	1.0	86	20.5	3.0	
26.0	16.5	6.4		0.1	0.9	92	23.9	2.6	
27.8	18.3	6.9		0.2	1.2	96	26.6	2.6	
27.9	18.9	6.8		0.3	1.4	98	27.4	2.8	
26.2	18.7	6.8		0.3	1.5	100	27.3	2.8	
25.4	18.5	6.4		0.4	1.5	100	26.8	2.9	

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Hastings silt loam
 Soil No.: S54Nebr-93-2-(1-7)
 Location: 180 feet north and 75 feet east of southwest corner Sec. 32, T10N,
 R3W, York County, Nebraska.
 Topography: South facing 1 to 2 percent slope in gently undulating loess-
 mantled plain.
 Land use: Cultivated, wheat 1954.
 Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- 2351 A_{1p} 0-5" Dark grayish brown (10YR 4/1.5, dry) to very dark brown (10YR 2/2, moist) silt loam; fine granular structure; forms slightly hard blocky clods when tilled dry; friable, moist; abrupt smooth lower boundary.
- 2352 A₁₂ 5-16" Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2.5/2, moist) silt loam; breaks out in coarse blocks or prisms but crushes to fine granular structure; slightly hard, dry; very friable, moist; clear smooth lower boundary.
- 2353 B₁ 16-21" Brown (10YR 4.5/3, dry) to dark brown (10YR 3/3, moist) silty clay loam; weak coarse prismatic separating easily to fine blocky structure; hard, dry; firm, moist; gradual smooth lower boundary.
- 2354 B₂₁ 21-32" Grayish brown (10YR 5/2.5, dry) to dark brown (10YR 4/3, moist) heavy silty clay loam or silty clay; weak coarse prisms separating easily to strong medium blocky structure; hard, dry; firm, moist; moderate glaze on blocky peds.
- 2355 B₂₂ 32-42" Pale brown (10YR 6/3, dry) to brown (10YR 5/3, moist) silty clay loam; moderate to strong medium blocky structure; hard, dry; firm, moist; some dark organic staining along the better defined vertical structure planes; gradual smooth lower boundary.
- 2356 B₃ 42-51" Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) heavy silt loam; moderate to weak medium and coarse blocky structure; slightly hard, dry; friable, moist; abundant thread-like pores and channels, some of which contain dead roots; gradual smooth lower boundary.
- 2357 C 51-60" Pale yellow (2.5Y 8/4, dry) to light yellowish brown (10YR 6/4, moist) silt loam; few faint fine yellowish brown and brown mottles; massive; soft, dry; very friable, moist; numerous fine thread-like pores and channels some of which contain dead roots; no effervescence with dilute HCl.

SOIL TYPE Holdrege silt loam LOCATION Phelps County, Nebraska

SOIL NOS. 854-Nebr-69-1-(1-8) LAB. NOS. 2178-2185

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1b		3A1						2A2		
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	> 2			
0-7	Alp	0.1	0.2	0.4	1.2	16.6	59.9	21.6	61.6	15.8	-	sil
7-11	A12	-	-	0.1	0.3	11.0	59.2	29.4	53.1	17.2	-	sic1
11-14	A3	-	0.1	0.2	0.5	11.7	56.1	31.4	51.3	16.9	-	sic1
14-21	B21	-	-	0.1	0.3	9.3	61.7	28.6	53.0	18.1	-	sic1
21-27	B22	-	0.1	0.2	0.7	11.6	64.4	23.0	56.6	19.8	-	sil
27-35	B3	-	0.1	0.2	0.9	15.8	66.3	16.7	61.8	20.9	-	sil
35-42	Bca	0.1	0.1	0.2	0.5	12.2	71.1	15.8	61.1	22.7	-	sil
42-60	Cca	0.2	0.3	0.3	0.8	16.3	65.6	16.5	60.4	22.0	-	sil

8C1b SATU- RATED PASTE	pH		ORGANIC MATTER				ELECTRI- CAL CONDUCTI- VITY EC-10 ³ MILLIMOS PER CM	MOISTURE TENSIONS			
	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO- GEN %	C/N	6E1a CoCO ₃ equiv- alent %		GYPSSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
5.9	6.5	6.6	1.38	.120	11.5	-	-	-	-	10.0	
6.2	6.9	6.9	1.13	.109	10.4	-	-	-	-	13.6	
6.4	7.2	7.4	0.86	.088	9.8	-	-	-	-	14.7	
6.7	7.3	7.8	0.49	.059	8.3	-	-	-	-	13.6	
7.0	7.7	8.0	0.26	.038	6.8	-	-	-	-	11.4	
7.3	8.1	8.2	0.08			-	-	-	-	10.4	
7.8	8.7	8.9	0.12			2	-	-	-	10.0	
7.9	8.9	9.1	0.09			3	-	-	-	9.9	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. %	5A3a Sum Cat- ions me/100g	8D3 Ca/Mg	MOISTURE AT SATU- RATION %
	6N2b Ca	6O2b Mg	6P2a H	6Q2a Na	6Q2a K				
	millequivalents per 100g. soil								
19.2	11.3	3.8		0.1	1.5	87	16.7	3.0	
23.7	16.0	5.6		0.1	1.0	96	22.7	2.8	
24.9	14.6	6.6		0.1	1.0	90	22.3	2.2	
24.4	14.6	6.9		0.1	1.2	93	22.8	2.1	
22.6	16.0	6.6		0.2	1.4	100	24.2	2.4	
21.6	14.1	6.8		0.1	1.8	100	22.8	2.1	
20.7				0.2	1.9				
20.7				0.4	2.1				

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Holdrege silt loam

Soil No.: S54Nebr-69-1-(1-8)

Location: 325 feet east and 75 feet south of northwest corner Sec. 28, T6N, R16W. North of Holdrege, 2 miles north of intersection of Highways 6 and 183, Phelps County, Nebraska.

Topography: 2 to 3 percent west facing, smooth slightly convex slope, slight erosion; gently undulating loess plain with slight relief.

Use: Summer fallow 1954. Dryland farmed to corn and wheat. Operator knows of no past management practices which would affect chemical or physical properties of the soil in an unusual way. No lime, fertilizer or manure has been added; has not been irrigated; has been farmed many years, probably 40 years or longer.

Described by: B. H. Williams

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|-----------------|--------|---|
| 2178 | A _{1p} | 0-7" | Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) heavy silt loam; strong medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; numerous fragments of decaying straw and roots throughout; abrupt smooth boundary. |
| 2179 | A ₁₂ | 7-11" | Dark gray (10YR 4/1.5, dry) very dark brown (10YR 2/2, moist) silty clay loam; strong medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; fine roots abundant; clear smooth boundary. |
| 2180 | A ₃ | 11-14" | Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) crushing to 10YR 4/2.5, moist, silty clay loam; strong medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; fine roots abundant; clear smooth boundary. |
| 2181 | B ₂₁ | 14-21" | Light brownish gray (10YR 6/2.5, dry) dark grayish brown (10YR 4/2.5, moist) silty clay loam; weak coarse prismatic breaking to strong medium and fine blocky structure; hard dry, friable moist; fine roots plentiful; numerous worm casts; noncalcareous; dark material from above has moved down cracks along faces of larger aggregates; clear smooth boundary. |
| 2182 | B ₂₂ | 21-27" | Pale brown (10YR 6/3 dry) brown (10YR 5/3 moist) heavy silt loam; weak coarse prismatic breaking to moderate medium subangular blocky structure; hard dry, friable moist; noncalcareous; fine roots plentiful; clear smooth boundary. |
| 2183 | B ₃ | 27-35" | Very pale brown (10YR 6/3, dry) light olive brown (2.5Y 5/4, moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocky structure; slightly hard dry, friable moist; noncalcareous with lower inch weakly calcareous; many fine and medium pores and root openings; few fine roots; abrupt boundary. |
| 2184 | B _{ca} | 35-42" | Light gray (10YR 7/2, dry) light olive brown (2.5Y 5.5/4, moist) silt loam; weak very coarse prismatic to very weak medium subangular blocky structure; soft dry, very friable moist; strongly calcareous throughout with numerous soft CaCO ₃ concretions and white spots of segregated CaCO ₃ ; numerous fine pores, few roots; gradual wavy boundary. |
| 2185 | C _{ca} | 42-60" | Light gray (10YR 7/2, dry) light olive brown (2.5Y 5.5/4, moist) silt loam with many distinct fine and medium yellowish brown mottles; weak very coarse prismatic; soft dry, very friable moist; calcareous throughout with many white CaCO ₃ segregations; numerous pores and openings filled or coated with white CaCO ₃ ; numerous insect burrows, some filled with darker-colored materials from above. |

Horizons A_{1p}, A₁₂, B₂₁, B₂₂ and C were sampled for the Bureau of Public Acads.

SOIL SURVEY LABORATORY

Mandan, N. Dak. 58/

1/20/35

SOIL TYPE Holdrege
silt loam

LOCATION Phelps County, Nebraska

SOIL NOS. 554Nebr-69-2-(1-8)

LAB. NOS. 2185-2193

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									TEXTURAL CLASS	
		1A1b		3A1					2A2			
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2			
2-1	1.0-5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-7	Alp	-	0.3	0.5	1.6	14.2	61.4	22.0	59.1	17.5	-	sil
7-13	Al2	-	0.1	0.2	0.7	11.0	58.4	29.6	53.5	16.4	-	sicl
13-16	A3	-	0.2	0.3	0.6	12.2	55.3	31.4	50.9	17.0	-	sicl
16-24	B21	0.1	0.2	0.3	0.6	10.0	58.9	29.9	52.6	16.7	-	sicl
24-30	E22	-	0.2	0.3	0.8	11.8	62.1	24.8	55.4	19.1	-	sil
30-34	B3	-	0.2	0.3	0.9	13.5	64.3	20.8	58.8	19.6	-	sil
34-42	Bca	0.1	0.2	0.3	1.1	14.5	65.1	18.7	57.1	21.2	-	sil
42-60	Cca	-	0.1	0.3	0.9	15.5	64.5	18.7	59.7	20.9	-	sil

8C1b SATURATED PASTE	pH 8C1a	ORGANIC MATTER				ESTD SALT (BUREAU CLP)	ELECTRICAL CONDUCTIVITY EC $\times 10^3$ MILLIMHOS PER CM	6E1a MOISTURE TENSIONS		
		8C1a	6A1a	6B1a	4B2					
		1:5	ORGANIC CARBON %	NITROGEN %				1/10 ATMOS. %		
5.8	6.6	6.7	1.68	.134	12.5	-	-	9.9		
6.5	7.1	7.3	1.34	.120	11.2	-	-	13.5		
6.4	6.8	7.2	0.89	.088	10.1	-	-	14.4		
6.5	7.1	7.3	0.52	.067	7.8	-	-	13.5		
6.7	7.7	7.9	0.31			-	-	11.8		
7.6	8.5	8.7	0.23			1		11.0		
7.8	8.6	8.9	0.17			3		10.3		
8.0	8.8	9.0	0.14			3		9.8		

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. %	5C1	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	6N2b	6O2b	6P2a	6Q2a						
	Ca	Mg	H	Na	K					
19.5	11.7	3.9		0.1	1.8	90		17.5	3.0	
24.0	17.0	5.2		0.1	1.0	97		23.3	3.3	
25.1	17.3	6.5		0.1	1.0	99		24.9	2.7	
24.5	16.5	6.8		0.1	1.2	100		24.6	2.4	
22.7	17.1	6.5		0.1	1.4	100		25.2	2.6	
21.8				0.2	1.5					
20.0				0.2	1.7					
19.8				0.3	2.1					

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Holdrege silt loam
 Soil No.: 354 Nebr-69-2-(1-8)
 Location: 350 feet north and 250 feet east of southwest corner Sec. 25, T6N, R19W; 1 mile north and 3 miles west of Holdrege, Phelps County, Nebraska. (North of school yard.)
 Topography: Smooth, slightly convex 2 percent west facing slope with slight erosion. Gently undulating loess plain with slight relief.
 Use: Summer fallow 1954. Wheat and summer fallow for past ten years with corn and wheat prior to that. Farmed for many years but no estimate of how many.
 Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|-----------------|--------|---|
| 2186 | A _{1p} | 0-7" | Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure; soft, dry; very friable moist; abrupt smooth boundary. |
| 2187 | A ₁₂ | 7-13" | Dark gray (10YR 4/1.5, dry) very dark brown (10YR 2.5/2, moist) heavy silt loam; strong medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; many fine pores, many worm casts; clear smooth boundary. |
| 2188 | A ₃ | 13-16" | Dark grayish brown (10YR 4/2, dry) very dark grayish brown (10YR 3/2, moist) light silty clay loam; strong medium and fine granular structure; slightly hard dry, friable moist; many fine roots; considerable mixing of soil material by insects; clear smooth boundary. |
| 2189 | B ₂₁ | 16-24" | Grayish brown (10YR 5/2, dry) dark grayish brown (10YR 4/2, moist) mixed by insects, some movement of darker materials along aggregate faces, silty clay loam; weak coarse prismatic breaking to strong medium and fine blocky structure; hard dry, friable moist; many fine and medium pores and a few open insect burrows, abundant roots; noncalcareous; clear smooth boundary. |
| 2190 | B ₂₂ | 24-30" | Light brownish gray (10YR 6/2.5, dry) brown (10YR 5/3, moist) silty clay loam; weak coarse prismatic breaking to moderate medium and fine subangular blocky structure; slightly hard dry, friable moist; many fine and medium pores; some large open insect burrows and a few insect burrows filled with darker soil materials; fine roots plentiful; noncalcareous; clear smooth boundary. |
| 2191 | B ₃ | 30-34" | Pale brown (10YR 6/3, dry) grayish brown (10YR 5/2.5, moist) silt loam or light silty clay loam; moderate coarse prismatic breaking to moderate medium subangular blocky structure; slightly hard dry, very friable moist; many medium and fine pores, a few dark-colored worm casts; few fine roots; noncalcareous; clear smooth boundary. |
| 2192 | B _{ca} | 34-42" | Light gray or pale brown (10YR 7/2.5, dry) light brownish gray (10YR 6/2.5, moist) silt loam with a few worm casts

of darker material (10YR 5/3, moist) moderate coarse prismatic breaking to moderate medium to very coarse subangular blocky structure; few fine roots; calcareous throughout with many soft white concretions and spots of CaCO ₃ ; many fine and medium pores and root openings, walls of most coated with CaCO ₃ ; gradual smooth boundary. |
| 2193 | C _{ca} | 42-60" | Light gray (10YR 7/2, dry) brown (10YR 5/3.5, moist) silt loam with few distinct fine yellowish brown mottles; weak very coarse prismatic structure; soft dry, very friable moist; many fine white spots and soft CaCO ₃ concretions 1/8 to 1/4 inch in diameter, white coatings of CaCO ₃ on prism faces; a few fine roots; numerous fine and very fine pores. |

SOIL SURVEY LABORATORY

SOIL TYPE Hard silt loam

Mandan, N. Dak.

SOIL NO. S50Nebr-10-2-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS			
			1B1a		3A1						2A2					
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002							
313	0-5	A1p	-	0.4	1.1	6.2	15.8	58.7	17.8	13.6	64.8	-	sil			
314	5-9	A12	-	0.3	1.3	7.9	14.5	56.6	19.4	14.0	62.0	-	sil			
315	9-15	A13	-	0.4	1.7	10.0	16.3	52.6	19.0	15.0	60.3	-	sil			
316	15-22	B1	-	-	1.5	10.6	16.4	49.1	22.4	13.0	59.2	-	l			
317	22-31	B2	-	0.3	1.2	15.2	17.3	42.6	23.4	9.9	59.9	-	l			
318	31-44	B3	-	0.1	1.0	10.2	19.3	49.6	19.8	11.0	65.1	-	l			
319	44-62	C	0.1	0.5	1.9	11.2	18.2	51.3	16.8	14.0	62.3	-	sil			
			pH			ORGANIC MATTER			EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY ECx10 ³ MILLIMHOS PER CM @1a	CaCO ₃ equivalent	GYPSUM me./100g SOIL	MOISTURE TENSIONS			
			SATURATED PASTE	1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N					1/10 ATMOS.	(per cent) 1/3 ATMOS.	15 ATMOS.	
			8C1b	8C1a	8C1a	6A1a					6E1a	6F1a			4B2	
313	6.2	6.7	6.9	1.41			-	1.2	tr	-					8.0	
314	6.7	6.8	7.0	1.23			-	1.0	tr	-					8.5	
315	7.2	7.4	7.5	1.14			-	0.5	-	-					8.4	
316	7.5	7.6	7.8	0.82			-	0.6	tr	-					9.4	
317	7.8	8.0	8.2	0.49			-	0.6	tr	-					10.7	
318	8.1	8.4	8.6	0.29			-	0.6	-	-					9.6	
319	9.2	9.4	9.7	0.17			-	1.5	-	-					8.4	
			5A1a	5B1a CATIONS				5B1b	5D2	SATURATION EXTRACT SOLUBLE						8A
			EXCHANGE CAPACITY	EXTRACTABLE		EXCHANGEABLE		EXCHANGEABLE SODIUM PERCENTAGE ESP	6P1a	6Q1a	CO ₃		HCO ₃	Cl	SO ₄	PER CENT MOISTURE AT SATURATION
			meq./100g soil	Ca	Mg	Na	K		Na	K	milliequivalents per liter					
313	16.3	9.8	3.3	0.6	1.8	4	2.6	0.7								42.0
314	17.0	10.5	3.7	0.8	1.2	5	4.5	1.6								42.5
315	16.6	10.0	3.8	0.9	1.2	5	3.8	3.3								41.8
316	17.8	9.5	4.9	0.9	1.8	5	5.9	4.4								40.8
317	17.9	7.9	8.3	1.3	2.3	7	4.0	4.5								44.5
318	17.5	6.2	9.0	1.9	2.9	11	5.8	2.8								39.9
319	15.8		2.4	3.3	15	16.8	6.1									41.0

Soil type: Hord silt loam
 Soil No.: S50Nebr-10-2-(1-7)
 Location: 50 feet south of road and 900 feet west of northeast corner of northwest quarter of Sec. 15, T9N, R13W, Buffalo County, Nebraska.
 Topography: Platte River Valley terrace, slope under 1 percent.
 Drainage: Moderately good.
 Erosion: Little, if any.
 Parent material: Stream reworked and deposited aeolian materials.
 Land use: Irrigated corn in 1950.
 Described by: B. H. Williams.
 Date: July 12, 1950.

Horizon and
 Mandan
 Lab. Number

Alp 313	0 to 5 inches. Silt loam; granular, friable, 10YR 3/2 moist; abrupt lower boundary.
Al2 314	5 to 9 inches. Silt loam; large blocky, granular, friable, 10YR 2/2 moist; gradual boundary.
Al3 315	9 to 15 inches. Silt loam; blocky, crumb, friable, 10YR 3/2 moist; gradual boundary.
B1 316	15 to 22 inches. Silt loam, heavy; blocky, crumb, friable, 10YR 3/2 moist; gradual boundary.
B2 317	22 to 31 inches. Silty clay loam, heavy; strong blocky, moderately hard, dry; friable, moist, 10YR 4/3 moist; gradual boundary.
B3 318	31 to 44 inches. Silty clay loam; strong blocky, friable, plastic, 10YR 5/2 moist; abrupt lower boundary.
C 319	44 to 62 inches. Silt loam; massive, friable, 2.5Y 8/4 moist, calcareous concretions.

SOIL SURVEY LABORATORY
Mandan, North Dakota

SOIL TYPE Hard silt loam

SOIL NO. S51Nebr-40-12-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS		
			1B1a		3A1				2A2						
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002		0.2-0.02	0.02-0.002	0.2-0.02	> 2 (<19mm)	
956	0-6	A1p	0.3	0.3	0.9	1.7	18.6	53.4	24.8	15.2	57.3	-	-	-	sil
957	6-16	A12	0.1	0.2	0.5	1.8	14.5	61.5	21.4	17.2	59.9	-	-	-	sil
958	16-26	B2	0.1	0.2	0.5	4.1	10.4	57.8	26.9	18.4	53.0	-	-	-	sil
959	26-36	A1b	0.1	0.2	0.6	2.2	26.2	44.8	25.9	12.0	60.6	-	-	-	1
960	36-46	B21b	0.1	0.3	0.6	1.5	14.7	55.3	27.5	22.3	48.6	-	-	-	sic1-sil
961	46-56	B22b	0.1	0.2	0.4	1.4	6.7	55.9	35.3	24.6	38.6	-	-	-	sic1
962	56-66	C1bca	1.2	0.1	0.5	0.7	13.5	50.4	33.6	18.5	45.7	Tr. a	-	-	sic1
pH			ORGANIC MATTER			8A2 EST. % SALT (BUREAU CUP)		ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM		CaCO ₃ equivalent per cent		GYPSUM me./100g SOIL		MOISTURE TENSIONS (per cent) 1/10 ATMOS. 1/3 ATMOS. 15 ATMOS.	
SATURATED PASTE		1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N	8A1a	6F1a	6F1a	1/10	1/3	15	4B2		
8C1b	8C1a	8C1a	6A1a												
6.3	6.7	6.8	1.62			-	0.5	tr	-				10.0		
6.2	6.6	6.7	1.28			-	0.4	tr	-				10.4		
6.0	6.5	7.0	0.62			-	0.4	tr	-				12.0		
6.6	7.3	7.8	0.40			-	0.4	tr	-				12.5		
7.2	8.0	8.3	0.38			-	0.5	tr	-				12.7		
7.6	8.3	8.4	0.39			-	0.8	tr	-				16.2		
7.6	7.7	7.8	0.28			0.20	3.6	2	34				16.2		
5A1a CATION EXCHANGE CAPACITY		5B1a EXTRACTABLE		CATIONS EXCHANGEABLE		5B1b	5D2	SATURATION EXTRACT SOLUBLE 8A1						8A PER CENT MOISTURE AT SATURATION	
milliequivalents per 100g soil		Ca	Mg	Na	K	EXCHANGEABLE SODIUM PERCENTAGE ESP	6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄			
18.9	11.6	3.3	0.3	1.6	2	-	0.4						46.2		
18.6	11.2	4.1	0.3	0.7	2	0.6	tr						52.1		
18.9	9.7	6.7	0.3	1.2	2	0.9	0.2						54.1		
19.4	9.3	5.6	0.8	2.2	4	1.5	0.2						50.7		
20.3	9.7	7.2	1.1	3.0	5	1.7	0.4						46.8		
25.1	13.8	8.3	1.2	3.8	5	3.5	1.2						59.2		
23.9			0.9	3.5	4	7.8	4.5						62.7		
a. Largely calcareous concretions.															

Soil type: Hard silt loam
 Soil No.: S51Nebr-40-12-(1-7)
 Location: SE1/4, NE1/4, Sec. 6, T11N, R11W, Hall County, Nebraska.
 Vegetation: Cat stubble and sweet clover.
 Parent material: Loess.
 Physiographic position: Terrace.
 Topography: Level plain.
 Slope: 0.
 Erosion: None or slight.
 Drainage: Excellent.
 Moisture: Moist.
 Stoniness: None.
 Root distribution: Good.
 Described by: B. H. Williams.
 Date: October 10, 1951.

Mandan

Lab.No.	Horizon	
956	Alp	0-6 inches. Dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist) silt loam, soft granular; friable when moist, soft to slightly hard when dry.
957	Al2	6-16 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam; granular; friable.
958	B2	16-26 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam; subangular blocky, friable when moist; slightly hard when dry.
959	Alb	26-36 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; subangular blocky; friable.
960	B21b	36-46 inches. Grayish brown (10YR 5/2.5 dry) to dark gray (10YR 4/1.5 moist) silt loam; crumb; friable.
961	B22b	46-56 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam, friable.
962	Clbca	56-66 inches. Pale brown (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2 moist) heavy silt loam or light silty clay loam; subangular, blocky; thread-like streaks and medium-sized spots and flecks of calcium carbonate and other salts present; friable.

SOIL SURVEY LABORATORY

SOIL TYPE Hard silt loam

Mandan, North Dakota

SOIL NO. S52Nebr-40-4-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
			1B1a		MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	2A2 > 2 (19mm)			
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5									
1192	0-6	A1p	0.2	0.5	0.9	1.9	14.5	61.6	20.4	15.1	62.2	—	sil
1193	6-16	A12	—	0.6	1.0	2.4	14.8	56.4	24.8	15.0	57.7	—	sil
1194	16-23	B21	—	0.4	0.9	2.1	18.0	53.9	24.7	12.1	61.1	—	sil
1195	23-35	B22	0.1	0.7	1.1	1.7	15.3	56.5	24.6	14.2	58.6	—	sil
1196	35-46	C	0.4	0.8	1.1	2.4	32.1	45.4	17.8	8.3	70.7	—	l
1197	46-58	D1	1.3	4.4	10.7	17.5	12.2	36.6	17.3	10.3	46.6	Tr.	l
1198	58-66	D2	0.5	1.1	1.2	1.6	2.2	59.5	33.9	41.8	20.7	—	sic1
pH		ORGANIC MATTER				8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	CaCO3 equivalent per cent 6B1a	GYPSUM me./100g SOIL 6F1a	MOISTURE TENSIONS			
SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N				1/10 ATMOS.	(per cent) 1/3 ATMOS.	15 ATMOS. 4B2		
6.1	6.8	7.0	1.95			—	0.4	tr				10.7	
5.8	6.7	6.7	1.34			—	0.3	tr				12.6	
6.2	7.1	7.2	0.76			—	0.3	tr				12.2	
6.5	7.4	7.5	0.41			—	0.3	tr				12.3	
6.8	7.8	7.9	0.21			—	0.4	tr				9.4	
7.4	8.5	8.6	0.15			—	0.7	tr				8.6	
7.7	8.9	9.1	0.33			—	0.6	4				19.2	
5A1a CATION EXCHANGE CAPACITY ME/100g	5B1a EXTRACTABLE Ca 6O2b	5B1b EXCHANGEABLE Mg 6O2b	5B1b EXCHANGEABLE Na 6P2a	5B1b EXCHANGEABLE K 6Q2a	5D2 EXCHANGEABLE SODIUM PERCENTAGE EXP	SATURATION EXTRACT SOLUBLE 8A1						8A PER CENT MOISTURE AT SATURATION	
	milliequivalents per 100g soil					6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄		
								milliequivalents per liter					
19.6	12.4	3.5	0.1	1.9	—	0.6	0.9					42.8	
20.6	12.2	4.0	0.1	1.7	—	0.2	0.5					46.4	
19.6	12.0	4.2	0.1	2.0	—	0.2	0.9					50.3	
20.0	12.4	4.9	0.1	2.2	—	0.6	0.5					53.3	
16.3	10.2	4.3	0.1	1.8	1	1.3	0.8					44.7	
15.1	10.2	4.4	0.3	1.8	2	2.2	0.9					36.1	
30.9			1.5	3.9	5	3.7	0.9					64.4	

Soil Type: Hard silt loam
 Soil No.: 852Nebr-40-4-(1-7)
 Date: September 1952
 County: Hall County, Nebraska.
 Location: 150 feet north and 100 feet west of southeast corner Sec. 31, T11N R10W.
 Described by: B. H. Williams.
 Mandan

Lab.No.	Horizon	
1192	Alp	0-6 inches. Very dark gray (10YR 3/1 moist) to gray (10YR 5/1 dry) fine granular, friable, silt loam.
1193	A12	6-16 inches. Very dark brown (10YR 2/3 moist) to dark gray (10YR 4/1 dry) granular, friable, silt loam.
1194	B21	16-23 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) weak medium blocky, friable, heavy silt loam; includes 1- or 2-inch layer B1 transition.
1195	B22	23-35 inches. Dark grayish brown (10YR 4/2 moist) to light brownish gray (10YR 6/2 dry) medium blocky, friable, heavy silt loam.
1196	C	35-46 inches. Grayish brown (10YR 5/2 moist) to light brownish gray (10YR 5.5/2 dry) massive to weak subangular blocky, friable, silt loam containing a fairly high proportion of coarse silt and noticeable very fine sand.
1197	D1	46-58 inches. Pale brown and grayish brown, moist, stratified silt loam, loam, fine sandy loam and loamy sand alluvium. Strata appreciably distorted from the horizontal.
1198	D2	58-66 inches. Dark grayish brown (10YR 4/2 moist) to light brownish gray (10YR 6/2 dry) massive to weak blocky silt loam; friable, an old dark colored soil or dark sedimentary layer; strongly calcareous, including an abundance of white spots and seams of lime carbonate. None of the white spots seem to be of other kinds of salts.

Note: Auger examination below 66 inches; from 66 to 112 inches is loamy alluvium that becomes sandier with depth; fine sand below 112 inches.

SOIL SURVEY LABORATORY
 mandan, North Dakota

SOIL TYPE Hord silt loam
 SOIL NO. S52Nebr-40-5-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
			1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	3A1 0.02-0.002	0.2-0.02	2A2 > 2	
1199	0-6	A1p	0.4	0.4	0.4	2.1	19.2	59.2	18.4	13.0	66.6	---	sil
1200	6-11	A12	---	0.2	0.4	1.5	16.9	55.9	25.1	10.5	63.5	---	sil
1201	11-19	B21	---	0.1	0.3	1.6	15.6	60.7	21.7	15.3	62.2	---	sil
1202	19-24	B22	---	0.2	0.5	2.2	16.6	59.5	21.0	15.9	61.9	---	sil
1203	24-31	B31	---	0.1	0.2	2.0	21.5	59.4	16.8	12.2	70.1	---	sil
1204	31-41	B32	---	0.2	0.3	1.2	16.3	66.6	15.4	15.5	68.3	---	sil
1205	41-49	C1	---	0.1	0.4	6.4	41.7	42.9	8.5	5.8	84.2	---	l
1206	49-54	C2ca	0.1	0.2	0.3	1.1	20.0	65.5	12.8	15.4	70.9	---	sil
1207	54-62	C3	---	---	0.2	1.4	31.9	57.0	9.5	7.5	82.2	---	sil
	pH		ORGANIC MATTER			8A2 EST. %	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	CaCO ₃ equivalent per cent 6E1a	GYPSUM ms./100g SOIL 6F1a	MOISTURE TENSIONS (per cent)			
	SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N	(BUREAU CUR)			1/10 ATMOS.	1/3 ATMOS.	15 ATMOS. 4B2	
	6.3	7.0	7.0	1.39			---	0.4	1	---			10.0
	6.0	7.3	7.4	1.12			---	0.3	1	---			11.1
	6.6	7.4	7.5	0.78			---	0.4	tr	---			11.3
	6.7	7.5	7.6	0.52			---	0.3	tr	---			10.9
	6.6	7.6	7.7	0.30			---	0.4	tr	---			9.3
	7.0	7.8	7.9	0.22			---	0.4	tr	---			8.8
	7.7	8.6	8.7	0.06			---	0.7	tr	---			5.3
	7.8	8.7	8.9	0.10			---	0.6	1	---			8.0
	7.8	8.8	9.0	0.05			---	0.6	tr	---			6.0
	5A1a CATION EXCHANGE CAPACITY NH ₄ Ca	5B1a EXTRACTABLE Ca 6N2b		5B1b EXCHANGEABLE Na 6P2a		5D2 K 6Q2a	SATURATION EXTRACT SOLUBLE 8A1						8A PER CENT MOISTURE AT SATURATION
	milliequivalents per 100g soil					EXCHANGEABLE SODIUM PERCENTAGE ESP	6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄	
	17.4		3.3	0.1	1.2	---	0.2	0.5					40.1
	19.2		4.2	0.1	1.0	---	0.2	0.5					56.2
	18.9	12.8	4.2	0.1	0.8	---	0.6	0.2					52.8
	18.5	12.6	4.3	0.1	1.0	---	0.6	0.2					50.3
	16.4	10.9	3.9	0.1	1.2	1	0.6	0.2					46.8
	16.5	10.8	4.0	0.1	1.9	1	0.6	0.8					44.7
	10.5	7.8	3.0	0.1	1.2	1	0.9	1.0					36.3
	15.6			0.1	2.2	1	1.3	1.3					42.8
	11.8	10.6	4.0		1.7	---	1.7	1.0					38.6

Soil Type: Hord silt loam
 Soil No.: S52Nebr-40-5-(1-9)
 Date: September 1952
 County: Hall County, Nebraska.
 Location: NW1/4 of SW1/4 of Sec. 10, T10N, R11W.
 Described by: B. H. Williams.
 Mandan

Lab.No.	Horizon	Description
1199	A1p	0-6 inches. Dark gray (10YR 4/1 moist) to gray (10YR 5/1.5 dry) granular, friable, silt loam.
1200	A12	6-11 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) granular, friable, silt loam.
1201	B21	11-19 inches. Very dark grayish brown (10YR 3/2 moist) to grayish brown (10YR 5/2 dry) medium blocky, friable, heavy silt loam; includes probably 1 inch of AB transition.
1202	B22	19-24 inches. Dark grayish brown (10YR 4/2 moist) to light brownish gray (10YR 6/2 dry) heavy silt loam; weak blocky, friable.
1203	B31	24-31 inches. Pale brown (10YR 5.5/3 moist) to light brownish gray (10YR 6.5/2 dry) weak blocky, very friable silt loam.
1204	B32	31-41 inches. Pale brown (10YR 6/3 moist) to light gray (10YR 7/2 dry) very friable silt loam, on light side; weak vertical but no horizontal cleavage.
1205	C1	41-49 inches. Light brownish gray (10YR 6/2 moist) to light gray (10YR 7/2 dry) stratified very fine sandy loam and silt loam but over all of very fine sandy loam texture; firm in place but very friable when disturbed.
1206	C2ca	49-54 inches. Grayish brown (2.5Y 5/2 moist) to light gray (10YR 7/2 dry) silt loam with thin lenses of very fine sandy loam; numerous spots and seams of free lime carbonate; firm in place but friable when disturbed.
1207	C3	54-62 inches. About same as horizon next above except very fine sandy loam and less free lime.

Note: Stratified sandy and silty materials continue down to a nearly black buried soil at a depth of $6\frac{1}{2}$ feet. The buried soil is silt loam in the upper part and silty clay or silty clay loam in lower part and about dark grayish brown color in the heavy layer at 10 feet, 4 inches, the lowest depth examined; no free lime in the darkest upper part of the buried soil but slightly calcareous below $9\frac{1}{2}$ feet. This profile has weaker B horizon development and probably less clay in the B than S52Nebr-40-4. Both this profile and S52Nebr-40-4 are associated with the youngest soils on terrace alluvium and probably have less clayey B2 horizons than where associated with Wood River soils.

SOIL TYPE Keith LOCATION Deuel County, Nebraska
silt loam

SOIL NOS. S58Nebr-25-5-(1-7) LAB. NOS. 9417-9423

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a										
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	2A2			
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	> 2			
0-6	Alp	0.1	0.2	0.1	1.6	28.2	48.6	21.2	64.5	13.7	-	1
6-12	B21	<0.1	0.1	0.1	1.7	25.6	44.7	27.8	58.4	13.4	-	cl
12-16	B22	<0.1	0.1	0.1	1.7	24.8	46.5	26.8	57.2	15.6	-	1/cl
16-24	B3	<0.1	<0.1	<0.1	1.8	25.8	48.4	24.0	59.7	16.1	-	1
24-34	Cca	<0.1	0.1	<0.1	1.5a	28.1a	54.0	16.3	63.6	19.9	-	sil
34-41	C2	<0.1	0.1	0.1b	1.4b	30.2b	52.7	15.5	66.0	18.1	-	sil
41-60	C3	<0.1	<0.1	<0.1	1.2b	33.3b	52.0	13.5	70.0	16.3	-	sil

pH	ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	MOISTURE TENSIONS			
	8C1a	6A1a	6B1a	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHO PER CM	CaCO ₃ equiv- alent	GYPSUM me./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:1	%	%	C/N	8A1a	%	%	%	%	%
6.5	1.08	0.098	11.0	<0.20	0.4	<1				9.7
7.3	0.54	0.061	9	<0.20	0.4	<1				12.6
7.4	0.66	0.075	9	<0.20	0.4	<1				12.4
7.8	0.51	0.062	8	<0.20	0.5	<1				10.9
8.2	0.31			<0.20	0.6	6				10.6
8.5	0.21			<0.20	0.7	8				9.4
8.6	0.17			<0.20	0.9	6				8.5

5A1a	EXTRACTABLE CATIONS					5D2	SAT. EXT. SOL.		4B4	4A4a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a	Field State Water %	Vol. Wts. g/cc	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K		me. per liter	K			
	milliequivalents per 100g. soil						me. per liter				
16.4	12.3	3.2	3.2	0.1	1.5	1	0.3	0.6			49.8
21.2	16.3	5.1	2.0	0.1	2.3	<1	0.3	0.7			45.2
22.2	17.3	5.8	0.8	0.1	2.4	<1	0.4	0.9	13.5	1.34	55.5
21.0	18.2	6.0	<0.1	<0.1	2.7	<1	0.6	1.2			53.6
17.7			<0.1	0.5	3.1	2	1.6	1.5			47.3
16.4			<0.1	0.9	3.3	5	3.2	1.4			45.4
15.5			<0.1	1.6	3.2	9	5.2	1.2			45.1

a. Few CaCO₃ concr.
b. Few CaCO₃ concr.; trace smooth dark brown to black concr. (Fe-Mn?)

Soil type: Keith silt loam
 Soil No.: S58Nebr-25-5-(1-7)
 Location: 225 feet south and 135 feet east of west quarter corner Sec. 7,
 T14N, R41W; approximately 10 miles north of Big Springs, Deuel
 County, Nebraska.

Physiography: Loessial uplands.

Relief: 20 to 40 feet.

Slope: 1 to 2 percent smooth convex slope.

Aspect: South facing slope.

Parent material: Loess.

Drainage: Well drained.

Permeability: Moderate.

Salt or alkali: None.

Land use: Wheat 1958.

Climate: Average annual precipitation 18.5 inches; average annual temperature 49°F.

Collected by and date: John Elder, W. McKinzie, Robert Jordan, October 24, 1958.

Lincoln

Lab.

No. Horizon

- 9417 Alp 0-6", Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
- 9418 B21 6-12", Brown (10YR 4/3 dry) to dark brown (10YR 3/3 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
- 9419 B22 12-16", Brown (10YR 4/3 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
- 9420 B3 16-24", Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry soft, moist very friable; noncalcareous; abrupt smooth boundary.
- 9421 Cca 24-34", Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; weak coarse prismatic; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9422 C2 34-41", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9423 C3 41-60", Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; massive; dry soft, moist very friable; violent effervescence.

Worm activity throughout profile and very prominent in the B3 horizon.

Horizons Alp, B21 and Cca sampled for Bureau of Public Roads.

SOIL TYPE Keith LOCATION Deuel County, Nebraska
silt loam

SOIL NOS. 558 Nebr-25-6-(1-7) LAB. NOS. 9424-9430

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										2A2 > 2	TEXTURAL CLASS	
		1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1		0.02-0.002			0.002-0.0002
0-6	A1p	0.1	0.2	0.1	2.1	31.9	46.1	19.5	67.5	12.3	-	1		
6-11	B21	<0.1	0.1	0.1	1.9	30.8	44.3	22.8	64.2	12.5	-	1		
11-19	B22	<0.1	0.1	0.1	1.7	28.5	44.7	24.9	60.2	14.5	-	1		
19-23	B3	<0.1	0.1	0.1	1.9	29.7	46.8	21.4	62.5	15.7	-	1		
23-35	Cca	<0.1	<0.1	<0.1	1.5a	32.7a	51.4	14.4	67.5	18.0	-	sil		
35-46	C2	<0.1	0.1	0.1	1.7a	38.6a	45.8	13.7	72.2	13.7	-	1		
46-60	C3	<0.1	<0.1	<0.1	1.4a	43.9a	43.6	11.1	77.6	11.2	-	1		
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY		6E1a		MOISTURE TENSIONS			
8C1a		6A1a	6B1a	C/N		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CoCO ₃ equiv- alent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.		
1:1		1:10	%	%	%	%	8A1a	%	%	%	%	%		
6.6			1.00	0.091	11.0	<0.20	0.4	<1				9.0		
6.8			0.64	0.068	9	<0.20	0.4	<1				10.4		
7.3			0.52	0.065	8	<0.20	0.4	<1				11.4		
7.7			0.47	0.058	8	<0.20	0.5	1				10.6		
8.1			0.28	0.051	5	<0.20	0.5	7				10.1		
8.3			0.18			<0.20	0.6	6				8.3		
8.5			0.13			<0.20	0.7	5				7.2		
5A1a		EXTRACTABLE CATIONS					5B1a	5D2	SAT. EXT. SOL.		4B4	4A1a	8A	
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a	Field State Water %	Vol. Wts. g/cc	MOISTURE AT SATUR- RATION %			
	Co	Mg	H	Na	K			No				K		
	← milliequivalents per 100g. soil →													
16.0	11.4	3.0	2.4	0.1	1.8	1	0.2	0.8				44.7		
20.2	15.0	3.9	2.9	0.1	1.6	<1	0.3	0.5				50.1		
21.8	16.8	4.7	1.2	<0.1	1.8	<1	0.4	0.6		12.3	1.34	52.7		
21.1	23.7	5.0	1.2	<0.1	2.0	<1	0.4	0.8				52.5		
17.4			<0.1	0.1	2.5	<1	0.5	1.1				49.1		
15.4			<0.1	0.5	3.0	2	1.8	1.4				43.9		
13.6			<0.1	1.1	3.0	7	3.7	1.2		7.6	1.30	43.9		

a. Few CaCO₃ concr.

Soil type: Keith silt loam

87

Soil No.: S58Nebr-25-6-(1-7)

Location: .15 mile south and 160 feet east of west quarter corner Sec. 2, T14N, R42W; approximately 10.5 miles north and 2 miles west of Big Springs, Deuel County, Nebraska.

Physiography: Loessial uplands.

Relief: 20 to 40 feet.

Slope: 1 to 2 percent convex.

Aspect: South facing slope.

Parent material: Loess.

Drainage: Well drained.

Permeability: Moderate.

Salt or alkali: None.

Land use: Wheat 1958.

Climate: Average annual precipitation 19.5 inches; average annual temperature 49°F.

Collected by and date: John Elder, Robert Jordan and W. McKinzie, Oct. 24, 1958.

Lincoln

Lab.

No. Horizon

- 9424 Alp 0-6", Grayish brown (1OYR 5/2 dry) to very dark grayish brown (1OYR 3/2 moist) silt loam; weak coarse subangular blocky; dry slightly hard, moist very friable; noncalcareous; abrupt smooth boundary.
- 9425 B21 6-11", Grayish brown (1OYR 5/2 dry) to very dark grayish brown (1OYR 3/2 moist) silt loam; weak coarse prismatic breaking to weak medium blocks; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
- 9426 B22 11-19", Brown (1OYR 5/3 dry) to dark brown (1OYR 3/3 moist) silt loam; weak coarse prismatic breaking to weak fine and medium subangular blocks; dry slightly hard, moist very friable; noncalcareous; clear smooth boundary.
- 9427 B3 19-23", Light brownish gray (1OYR 6/2 dry) to dark grayish brown (1OYR 4/2 moist) silt loam; weak coarse prismatic breaking to weak medium subangular blocks; dry soft, moist very friable; noncalcareous; abrupt wavy boundary.
- 9428 Cca 23-35", Light gray (1OYR 7/2 dry) to brown (1OYR 5/3 moist) silt loam; weak coarse prismatic; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9429 C2 35-46", Light gray (1OYR 7/2 dry) to brown (1OYR 5/3 moist) very fine sandy loam; massive; dry soft, moist very friable; violent effervescence; gradual smooth boundary.
- 9430 C3 46-60", Light gray (1OYR 7/2 dry) to pale brown (1OYR 6/3 moist) very fine sandy loam; massive; dry soft, moist very friable; violent effervescence.

Worm activity throughout the profile, some rodent activity. Horizons Alp, B21 and Cca sampled for Bureau of Public Roads.

SOIL TYPE Keith silt loam LOCATION Hitchcock County, Nebraska

SOIL NOS. S54Nebr-44-2-(1-7) LAB. NOS. 2395-2401

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1b		3A1					2A2			
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	> 2	
2-1	1.0-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-5	Alp	-	0.1b	0.2	1.0	28.0	52.4	18.3	66.9	14.1	-	sil
5-9	Al2	-	-	0.1b	0.3	20.2	55.4	24.0	60.3	15.5	-	sil
9-14	B21	-	-	0.1b	0.4	18.3	55.2	26.0	58.1	15.6	-	sil
14-23	B22	-	-	-	0.5	18.0	54.9	26.6	58.6	14.7	-	sil
23-33	Bea	-	0.1	0.2	1.1	22.1	50.4	26.1	57.6	15.4	-	sil
33-45	Cca	-	0.2b	0.3	1.1	27.7	53.4	17.3	61.0	20.7	-	sil
45-60	C	-	-	0.2b	0.9	30.7	53.3	14.9	66.1	18.4	-	sil

8C1b SATURATED PASTE	pH		ORGANIC MATTER			EST'S SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	MOISTURE TENSIONS				
	8C1a	8C1a	6A1a	6B1a	5E1a			6E1a		4E2		
	1:5	1:10	ORGANIC CARBON %	NITROGEN %				C/N	CaCO ₃ equiv- alent %	GYP SUM mo./100g SOIL	1/10 ATMOS. %	1/3 ATMOS. %
6.1	6.6	6.8	1.37	.122	11.2	-	-	-	-	-	9.1	
6.4	7.0	7.1	1.12	.111	10.1	-	-	-	-	-	11.3	
6.6	7.4	7.5	0.75	.081	9.2	-	-	-	-	-	12.1	
7.3	7.9	8.1	0.56	.068	8.2	-	-	-	-	-	12.5	
8.1	9.0	9.1	0.37	.049	7.6	8	8	8	8	8	12.1	
8.3	9.2	9.4	0.21			8	8	8	8	8	10.6	
8.4	9.3	9.5	0.14			6	6	6	6	6	9.4	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. %	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	6E2b		5E1a						
	Ca	Mg	H	Na	K				
18.2	11.8	2.5		0.1	2.3	92	16.7	4.7	
21.5	15.1	3.6		0.3	1.7	96	20.7	4.2	
22.5	16.1	4.6		0.1	1.4	99	22.2	3.5	
23.1	16.4	5.2		0.3	2.0	100	23.9	3.2	
20.9				0.3	2.8				
19.6				0.6	3.6				
18.9				1.3	3.5				

a. Particle size analyses by Beltsville Laboratory.
 b. Organic matter in sand fractions.

Soil type: Keith silt loam

Soil No.: S54Nebr-44-2-(1-7)

Location: .2 mile south and 110 feet east of northwest corner Sec. 13, T1N, R34W; 8 miles south and 5 miles west of Trenton, Hitchcock County, Nebraska.

Topography: Southeast facing slope of 1 to 2 percent gradient near the edge of a broad gently undulating remnant of a loess-mantled plain; the slope becomes steeper to the west.

Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|-----------------|--------|--|
| 2395 | A _{1p} | 0-5" | Dark grayish brown (10YR 4/1.5, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary. |
| 2396 | A ₁₂ | 5-9" | Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure with vertical cleavage planes giving weak very coarse prisms; slightly hard, dry; friable, moist; clear smooth lower boundary. |
| 2397 | B ₂₁ | 9-14" | Dark grayish brown (10YR 4.5/2, dry) to very dark grayish brown (10YR 3.5/2, moist) silty clay loam; compound moderate coarse and medium prismatic and weak coarse and medium blocky structure with better defined vertical than horizontal cleavage; slightly hard, dry; friable, moist; clear smooth lower boundary. |
| 2398 | B ₂₂ | 14-23" | Grayish brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) silty clay loam; compound moderate medium and coarse prismatic and weak medium and fine blocky structure; slightly hard, dry; friable, moist; clear smooth lower boundary. |
| 2399 | B _{ca} | 23-33" | Light gray (10YR 7/2, dry) to pale brown (10YR 6/3, moist) heavy silt loam; weak subangular blocky structure with fairly well defined vertical cleavage; soft, dry; very friable, moist; calcareous; gradual lower boundary. |
| 2400 | C _{ca} | 33-45" | Light gray (10YR 7/2.5, dry) to pale brown (10YR 6/3, moist) silt loam; massive, but falls apart quite easily when moist into weak subangular blocks or lumps; soft, dry; very friable, moist; white lime spots and seams and disseminated lime throughout; violent effervescence; gradual smooth lower boundary. |
| 2401 | C | 45-60" | Light gray (10YR 7/2.5, dry) to pale brown (10YR 6/3, moist) silt loam; massive; soft, dry; very friable, moist; calcareous, including a few white spots and streaks of accumulated lime carbonate; strong effervescence. |

Horizons A_{1p}, A₁₂, B₂₁, B₂₂, C_{ca} and C were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY

Mandan, N. Dak. ^{2/}

9/21/55

SOIL TYPE Keith
silt loam

LOCATION Hitchcock County, Nebraska

SOIL NOS. S54Nebr-44-3-(1-7)

LAB. NOS. 2402-2408

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1A1b		3A1						2A2		
		VERY COARSE SAND 2.1	COARSE SAND 1.0-5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	Alp	0.1b	0.1b	0.2	0.9	24.3	53.9	20.5	62.2	16.5	-	sil
6-10	Al2	-	-	0.1b	0.5	19.6	53.4	26.4	56.7	16.6	-	sil
10-13	B1	-	0.1	0.3	0.9	19.9	52.4	26.4	56.8	16.0	-	sil
13-20	B2	-	-	0.1	0.4	21.6	52.3	25.6	57.8	16.4	-	sil
20-30	Bca	-	0.1	0.3	1.3	21.5	52.1	24.7	56.6	17.8	-	sil
30-42	Cca	-	-	0.1	0.6	24.0	55.4	19.9	58.9	20.9	-	sil
42-60	C	-	0.3	0.3	1.2	28.1	53.9	16.2	63.4	19.3	-	sil

8C1b SATURATED PASTE	pH		ORGANIC MATTER			EST. SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	6E1a		MOISTURE TENSIONS		
	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N			CoCO ₃ equivalent %	GYP-SUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	4E2 15 ATMOS. %
6.8	7.5	7.8	1.21	.104	11.6			-				9.8
6.9	7.8	7.9	0.82	.078	10.5			-				12.8
7.0	7.9	8.0	0.69	.071	9.7			-				12.6
7.1	8.1	8.2	0.57	.064	8.9			-				12.3
7.9	8.8	9.0	0.40	.052	7.7			3				12.7
8.1	9.1	9.3	0.29					8				11.9
8.1	9.1	9.3	0.15					6				10.0

5A1a CATION EXCHANGE CAPACITY me./100g. AC	EXTRACTABLE CATIONS					BASE SAT. %	5A3a Sum Cations me./100g	8D8 Ca/Mg	MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6P2a H	6Q2a Na	6Q2a K				
20.6	15.3	3.3		0.2	2.0	100	20.8	4.6	
20.5	16.9	3.9		0.2	1.6	100	22.6	4.3	
23.5	17.9	4.2		0.1	1.4	100	23.6	4.3	
23.4	17.5	4.6		0.1	1.4	100	23.6	3.3	
21.9				0.1	1.9				
20.6				0.2	2.7				
19.4				0.3	3.2				

← milliequivalents per 100g. soil →

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Keith silt loam

Soil No.: S54Nebr-44-3-(1-7)

91

Location: 225 feet east and 150 feet north of southwest corner Sec. 3, T1N, R53W; 7 miles south and 1 mile west of Trenton, Hitchcock County, Nebraska.

Topography: Southwest facing slope of 1 to 2 percent in an undulating landscape on a broad shallowly dissected loess-mantled interstream divide.

Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|-----------------|--------|---|
| 2402 | A _{1p} | 0-6" | Gray (1OYR 4/1.5, dry) to very dark grayish brown (1OYR 3/2, moist) silt loam; weak fine granular; soft, dry; friable, moist; abrupt smooth boundary. |
| 2403 | A ₁₂ | 6-10" | Dark grayish brown (1OYR 4/2, dry) to very dark grayish brown (1OYR 3/2, moist) silt loam; moderate fine granular; slightly hard, dry; friable, moist; some lighter-colored worm casts; smooth lower boundary. |
| 2404 | B ₁ | 10-13" | Dark grayish brown (1OYR 4.5/2, dry) to very dark grayish brown (1OYR 3.5/2, moist) silty clay loam; fine subangular blocky structure but some vertical cracks result in coarse primary blocky breakage when this layer is carefully removed from place; slightly hard, dry; friable, moist; much worm activity; clear smooth lower boundary. |
| 2405 | B ₂ | 13-20" | Grayish brown (1OYR 5/2.5, dry) to dark grayish brown (1OYR 4/2, moist) silty clay loam; weak coarse prismatic separating to moderate medium and fine blocky structure; slightly hard, dry; friable, moist; much worm mixing of material from above horizons; clear smooth lower boundary. |
| 2406 | B _{ca} | 20-30" | Light grayish brown (1OYR 6/2.5, dry) to grayish brown (1OYR 5/2.5, moist) heavy silt loam or silty clay loam; moderate fine and medium subangular blocky structure; slightly hard, dry; friable, moist; some dark worm casts from horizons above; white lime spots throughout and some disseminated lime in lower part; clear smooth lower boundary. |
| 2407 | C _{ca} | 30-42" | Light gray (1OYR 7.5/2, dry) to pale brown (1OYR 6/3, moist) heavy silt loam; massive but crushes into subangular block-like firm lumps and loose soft material; friable when moist; slightly hard, dry; violent effervescence; both segregated and disseminated lime; clear smooth lower boundary. |
| 2408 | C | 42-60" | Light gray (1OYR 7/2.5, dry) to pale brown (1OYR 5.5/3, moist) silt loam; massive; calcareous, including a few fine threads and spots of segregated lime carbonate. |

NOTE: Several rodent burrows (Krotovinas) were exposed in this profile pit. Careful sampling was necessary to avoid obtaining samples of the B horizons that were contaminated with darker and lighter-colored materials, respectively, from the A and C horizons. Mycelial and some film lime on peds in otherwise non-calcareous horizons had formed in an area of 2 to 4" surrounding strongly effervescent Krotovinas. There is good likelihood that more calcium is present in the A and upper B horizons than normal for Keith soils. However, intense rodent, worm and burrowing insect activity, much of it seemingly old activity, was observed over wide areas when selecting the present sampling sites.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

OIL TYPE Keith LOCATION Kimball County, Nebraska
silt loam

SOIL NOS. 857Nebr-53-3-(1-9) LAB. NOS. 5810-5818

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		3A1										
		1B1a	VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	2A2	> 2	
	2.1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.75	0.02-0.002	(19mm)		
0-5	Alp	2.8a	8.0	5.1	7.1	20.4	38.2	18.4	49.3	13.0	Tr.	1
5-7	Al2	1.8	5.1	3.7	5.2	20.3	42.5	21.4	51.0	15.0	1	1
7-10	B1	1.2	3.8	2.8	4.0	17.5	42.4	28.3	46.7	15.7	Tr.	cl
10-18	B21	0.4	2.0	1.6	2.9	17.3	45.6	30.2	48.0	16.8	Tr.	cl
18-23	B22	0.5	1.8	1.8	3.3	20.0	50.0	22.6	54.0	18.3	Tr.	sil/1
23-32	Clca	0.8	2.8	1.9	3.3	22.3	50.9	18.0	57.0	18.4	Tr.	sil/1
32-40	C2	0.6	2.7	2.1	3.4	24.4	49.8	17.0	59.9	16.5	Tr.	1
40-57	C3	1.6	7.6	5.2	7.3	29.3	36.6	12.4	59.6	10.8	Tr.	1
57-64	C4	5.4	16.4	11.9	15.6	26.5	16.3	7.9	47.4	4.3	2	sl

pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a			MOISTURE TENSIONS	
8C1b	8C1a	8C1a	6A1a	6B1a	EST. SALT (BUREAU CUP)	EC · 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv. / cent	GYPSUM / cent SOIL	1/10 ATMOS.	1/3 ATMOS.	4E2
Saturated Paste	1:1	1:10	ORGANIC CARBON %	NITROGEN %	C/N				%	%	15 ATMOS. %
6.4	6.8	7.3	0.92	.076	12.1	<0.20	0.6	-	-	-	8.6
6.3	6.7	7.2	0.87	.080	10.9	<0.20	0.6	-	-	-	10.0
6.5	7.0	7.4	0.54	.058	9.3	<0.20	0.6	-	-	-	13.3
6.7	7.3	7.8	0.45	.049	9.2	<0.20	0.6	-	-	-	15.0
7.3	7.9	8.5	0.42	.051	8.2	<0.20	0.8	-	-	-	12.3
7.8	8.6	9.4	0.25	.023	10.9	<0.20	0.8	8	-	-	11.2
8.0	8.9	9.6	0.17			<0.20	0.9	9	-	-	10.1
8.1	9.1	9.7	0.05			<0.20	1.1	4	-	-	7.1
8.2	9.1	9.7	0.02			<0.20	1.2	3	-	-	4.1

5A1a	EXTRACTABLE CATIONS 5B1a					5D2	SATURATION EXTRACT SOL.		4A3a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a	Vol Wt. g/cc	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K		Na	K		
	milliequivalents per 100g. soil						milliequivalents per liter			
15.3	10.3	2.9	3.5	-	1.8	-	0.2	1.1		33.9
17.3	11.1	3.2	3.9	-	1.8	-	0.3	0.8		39.1
21.4	14.0	4.9	2.4	0.1	2.0	-	0.4	0.8		47.8
25.8	16.1	6.8	2.8	0.2	2.8	1	0.6	0.8	1.38	53.3
24.8	16.3	7.0	0.8	0.5	3.2	2	1.4	1.2		46.0
19.3				1.0	3.1	5	3.1	1.3	1.34	41.0
17.6				1.7	3.2	8	5.2	1.0		40.3
14.2				2.1	2.6	13	7.1	0.9	1.30	32.3
9.2				1.3	1.4	12	7.9	0.8		24.9

a. Organic matter

Soil type: Keith silt loam

Location: Kimball County, Nebraska. 0.25 mile south and 30 feet west of NE corner Sec. 16, T16N, R54W. About 9 miles north and 1 mile west of Dlx, Nebraska.

Topography: Less than 1 percent slope in the gently undulating loess-covered plains.

Cultivated: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-3-(1-9)

Lincoln

Lab. No. Horizon

- 5810 Alp 0-5 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
- 5811 A12 5-7 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary. This horizon appears to be a plow pan with very weak platy structure.
- 5812 B1 7-10 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) heavy silt loam; compound weak coarse subangular blocky and weak medium subangular blocky structure; friable, moist; clear smooth lower boundary; broken clay skins on vertical and horizontal faces.
- 5813 B21 10-18 inches. Light brownish gray (10YR 6/2 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins on both vertical and horizontal faces.
- 5814 B22 18-23 inches. Light grayish brown (10YR 6.5/2 dry) to dark brown (10YR 4.5/3 moist) light silty clay loam; compound weak coarse prismatic and moderate medium subangular blocky structure; firm, moist; abrupt smooth lower boundary; broken clay skins on vertical and horizontal faces.
- 5815 C1ca 23-32 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; disseminated lime present in root channels and on structural facing; gradual smooth lower boundary; several 1-2 inch Krotovinas present in this horizon.
- 5816 C2 32-40 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; weak coarse prismatic structure; very friable, moist; violent effervescence; clear smooth lower boundary.
- 5817 C3 40-57 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) very fine sandy loam; weak coarse prismatic to massive structure; very friable, moist; violent effervescence; abrupt smooth lower boundary; pockets of fine gravel present in this horizon.
- 5818 C4 57-64 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loamy sand; massive structure; loose; strong effervescence.

Note: Horizons Alp, B21 and C3 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Keith LOCATION Kimball County, Nebraska
silt loam

SOIL NOS. S57Nebr-53-4-(1-9) LAB. NOS. 5819-5827

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		3A1										
		1B1a	VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	2A2	> 2	
2:1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	(19mm)			
0-6	Alp	1.0	4.5	3.4	5.7	21.2	43.0	21.2	52.6	14.6	Tr.	1
6-8	Al2	1.2	4.8	3.5	6.0	21.3	41.8	21.4	52.1	14.2	Tr.	1
8-11	B1	0.2	1.2	1.5	3.0	17.0	45.8	31.3	47.7	16.9	Tr.	cl
11-17	B21	-	0.5	0.7	2.1	16.7	49.9	30.1	49.7	18.3	Tr.	cl
17-23	B22	-	0.3	0.6	2.2	19.1	54.7	23.1	55.8	19.5	Tr.	sil
23-33	C1ca	-	0.3	0.5	2.1	22.0	57.3	17.8	60.4	20.4	-	sil
33-41	C2	-	0.4	0.6	2.1	24.7	56.0	16.2	64.2	18.0	-	sil
41-55	C3	-	0.6	0.8	3.4	31.0	50.4	13.8	68.7	15.1	Tr.	sil
55-65	C4	0.7a	1.8a	2.2a	5.5a	31.2a	46.8a	11.8	69.1	12.7	Tr.	1

pH	ORGANIC MATTER					8A2	ELECTRICAL CONDUCTIVITY EC-103 MILLIMOS PER CM @ 25°C	6E1a	MOISTURE TENSIONS			
	8C1b	8C1a	6A1a	6B1a	5B1a				4B2			
	Saturated Paste	1:1	1:10	ORGANIC CARBON %	NITROGEN %					C/N	EST% SALT (BUREAU CUP)	CoCO ₃ equiv-aleve
7.0	7.3	7.8	1.01	.082	12.3	<0.20	0.6	-	-	-	-	9.7
6.9	7.3	7.9	0.89	.075	11.9	<0.20	0.6	-	-	-	-	9.8
6.9	7.4	7.8	0.66	.066	10.0	<0.20	0.6	-	-	-	-	14.1
6.9	7.6	8.0	0.58	.062	9.4	<0.20	0.5	-	-	-	-	14.4
7.1	7.8	8.2	0.53	.058	9.1	<0.20	0.5	-	-	-	-	12.5
7.7	8.3	9.1	0.30	.032	9.4	<0.20	0.6	7	-	-	-	11.6
7.9	8.7	9.3	0.19			<0.20	0.7	8	-	-	-	10.5
8.0	9.0	9.5	0.13			<0.20	0.8	6	-	-	-	9.4
8.2	9.1	9.8	0.09			<0.20	1.1	6	-	-	-	8.2

5A1a	EXTRACTABLE CATIONS					5D2	SATURATION		EXTRACT SOL	4A3a	8A
	6M2b	6O2b	6H1a	6P2a	6Q2a		6P1a	6Q1a			
	Ca	Mg	H	Nc	K		EXCH. No %	K			
	← milliequivalents per 100g. soil →						← milliequivalents per liter →				
18.9	14.2	2.8	2.4	-	1.9	-	0.2	0.9	-	-	41.0
18.7	14.4	3.2	2.4	-	1.7	-	0.3	0.7	-	-	40.2
25.6	18.9	5.5	2.8	0.1	2.1	-	0.3	0.7	-	-	55.6
27.1	19.8	5.7	2.4	0.1	2.4	-	0.3	0.7	-	1.27	54.6
26.2	18.7	6.0	2.4	0.1	2.8	-	0.3	0.8	-	-	52.5
22.0				0.2	3.2	1	0.7	1.2	-	1.27	47.1
19.8				0.8	3.4	4	0.3	1.2	-	-	43.9
18.8				2.0	3.4	10	5.2	0.9	-	1.20	39.0
17.1				2.8	2.7	15	7.6	0.8	-	-	35.0

a. Few CaCO₃ coner.

Soil type: Keith silt loam

Location: Kimball County, Nebraska. 0.4 mile north and 100 feet east (fence) of SW corner Sec. 18, T16N, R53W.

About 8.5 miles north and 2 west of Dix, Nebraska.

Topography: Less than 1 percent slope in the gently undulating loess-covered plains.

Cultivated: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-4-(1-9).

Lincoln

Lab.No.	Horizon	
5819	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5820	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak coarse subangular blocky structure; very friable, moist; abrupt smooth lower boundary.
5821	B1	8-11 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) light silty clay loam; compound weak coarse subangular and weak medium subangular blocky structure; friable, moist; clear smooth lower boundary; broken clay skins on vertical and horizontal faces.
5822	B21	11-17 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins on vertical and horizontal faces.
5823	B22	17-23 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2.5 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; friable, moist; abrupt smooth lower boundary; broken clay skins on vertical faces; numerous worm casts present.
5824	Clca	23-33 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; gradual smooth lower boundary; few worm casts present; disseminated line present in root channels and on structural faces.
5825	C2	33-41 inches. Light gray (10YR 7/2 dry) to brown (10YR 5.5/3 moist) silt loam; weak coarse prismatic structure; very friable, moist; violent effervescence; gradual smooth lower boundary.
5826	C3	41-55 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) very fine sandy loam; weak coarse prismatic structure; very friable, moist; violent effervescence; gradual smooth lower boundary.
5827	C4	55-65 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) light very fine sandy loam; weak coarse prismatic to massive structure; violent effervescence. Small patches of fine gravel scattered through this horizon.

Note: The area from 23-55 inches has a few vertical and horizontal lenses of 10YR 4/1 moist, silt loam lenses range in thickness from 1-3 mm. Horizons Alp, B21 and C3 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY

Mandan, N. Dak. s/

9/21/55

SOIL TYPE Kansas
silt loam

LOCATION Hall County, Nebraska

SOIL NOS. S54Nebr-40-1-(1-7)

LAB. NOS. 2380-2386

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1b		3A1						2A2		
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.07	0.07-0.002	> 2	
0-7	Alp	-	1.8	1.4	2.5	23.0	52.4	18.8	62.5	14.5	-	sil
7-12	B2l	0.3	1.3	1.0	1.7	18.1	49.0	28.6	53.1	15.0	-	cl
12-18	B22	-	-	0.3	0.5	15.8	52.6	30.8	49.9	18.8	-	sicl
18-32	B3	-	0.1b	-	0.3	17.3	58.1	24.2	54.2	21.4	-	sil
32-38	C1	-	0.1	-	0.5	22.1	59.1	18.2	60.3	21.2	-	sil
38-53	C2ca	-	-	0.1	0.5	23.6	60.4	15.4	62.5	21.8	-	sil
53-60	C3	-	0.1	0.1	0.5	18.7	64.7	15.9	59.9	23.8	-	sil

8C1b SATURATED PASTE	pH		ORGANIC MATTER			ESTM SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHS PER CM	6E1a		MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	C/N			CoCO ₃ equiv-ent	GYPSUM me./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	% ORGANIC CARBON	% NITRO-GEN								
5.6	6.3	6.4	1.09	.106	10.3	-	-	-	-	-	9.1	
5.9	6.7	6.7	0.82	.082	10.0	-	-	-	-	-	13.0	
5.9	6.9	6.9	0.43	.056	7.7	-	-	-	-	-	14.2	
6.3	7.2	7.2	0.23	.035		-	-	-	-	-	12.4	
7.0	7.9	7.9	0.16			-	-	-	-	-	10.7	
7.8	8.8	8.9	0.13			1	-	-	-	-	10.1	
7.8	8.7	8.9	0.10			-	-	-	-	-	10.0	

5A1a CATION EXCHANGE CAPACITY ME/100g AC	EXTRACTABLE CATIONS					BASE SAT. %	5E1a Na	5A3a K	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	6E2b Ca	6O2b Mg	6E2a H No K								
	milliequivalents per 100g. soil										
17.4	10.0	3.5		0.1	1.6	87			15.2	2.8	
23.6	14.6	5.2		0.1	1.2	89			21.1	2.8	
25.5	16.7	6.0		0.1	1.1	94			23.9	2.8	
23.5	16.4	5.1		0.1	1.4	98			23.0	3.2	
21.9	16.6	4.2		0.1	1.5	100			22.4	4.0	
21.1		4.5		0.2	1.6						
21.0		5.5		0.2	2.1						

- a. Particle size analyses by Beltsville Laboratory.
- b. Organic matter in sand fractions.

Soil type: Kenesaw silt loam

97

Soil No.: S54Nebr-40-1-(1-7)

Location: 400 feet north and 80 feet east of west quarter corner Sec. 28, T9N, R10W; 4 miles west and 3-1/2 miles south of Doniphan, Hall County, Nebraska.

Topography: South facing 2 to 3 percent slope in gently undulating to undulating loess-mantled plain with indefinite or poorly developed surface drainage.

Described by: B. H. Williams.

Mandan

lab.

No. Horizon Depth

- | No. | Horizon | Depth | Description |
|------|------------------|--------|---|
| 2380 | A _{1p} | 0-7" | Grayish brown (10YR 5/2, dry) to very dark grayish brown (10YR 3.5/2, moist) silt loam; weak fine granular structure soft, dry; friable, moist; abrupt lower boundary. |
| 2381 | B ₂₁ | 7-12" | Grayish brown or brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) silty clay loam; moderate coarse prismatic structure separating to weak fine blocky or fine subangular blocky peds; hard, dry; firm, moist. |
| 2382 | B ₂₂ | 12-18" | Light grayish brown (10YR 6/2, dry) to dark grayish brown (10YR 4/2.5, moist) silty clay loam; few faint fine yellowish brown and gray mottles in the lower part; compound moderate coarse prismatic and coarse blocky and weak fine blocky structure; hard, dry; friable, moist. |
| 2383 | B ₃ | 18-32" | Pale brown (10YR 6/3, dry) to light olive brown (2.5Y 5/3 moist) light silty clay loam; compound weak coarse prismatic and weak coarse blocky; slightly hard, dry; friable, moist; gradual lower boundary. |
| 2384 | O ₁ | 32-38" | Light gray (10YR 7/2, dry) to light brownish gray (10YR 6/2, moist) silt loam; massive or weak coarse blocky structure; slightly hard, dry; friable, moist; noncalcareous; clear wavy lower boundary. |
| 2385 | C _{2ca} | 38-53" | Light gray (10YR 7/2, dry) to pale brown (10YR 6/2.5, moist) silt loam; massive; soft, dry; friable, moist; strongly calcareous; some segregated but mainly disseminated lime. |
| 2386 | C ₃ | 53-60" | Pale yellow (2.5Y 8/3, dry) light yellowish brown (2.5Y 6/3, moist) silt loam; massive; soft, dry; very friable, moist; calcareous. |

SOIL SURVEY LABORATORY

Mandan, N. Dak. 8/

9/22/55

SOIL TYPE Kenesaw
silt loam

LOCATION Hamilton County, Nebraska

SOIL NOS. S54Nebr-41-1-(1-6)

LAB. NOS. 2374-2379

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1b					3A1					
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002			> 2	
0-7	Alp	0.1b	0.1b	0.2	0.9	16.6	57.2	24.9	58.6	15.8	-	sil
7-15	B2	-	0.1	0.1	0.6	13.3	57.6	28.3	51.4	19.9	-	sic1
15-24	B3	-	-	0.1	0.3	13.9	61.0	24.7	53.9	21.2	-	sil
24-33	Bca	-	0.1	0.2	1.0	19.5	57.4	21.8	56.4	21.0	-	sil
33-48	Cca	-	0.1	0.2	0.5	14.3	64.3	20.6	55.1	23.8	-	sil
48-60	C	-	-	0.1	0.3	13.6	66.6	19.4	57.1	23.3	-	sil

8C1b SATURATED PASTE	pH 8C1a	8C1a 1:10	ORGANIC MATTER			ESTIM. SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC-103 MILLIMOS PER CM	6E1a MOISTURE TENSIONS			4B2
			6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N			6C1a 1/10 ATMOS. %	6D1a 1/3 ATMOS. %	6E1a 15 ATMOS. %	
6.1	6.9	7.0	0.96	.093	10.3	-	-	-	-	10.6	
6.6	7.5	7.6	0.35	.046	7.6	-	-	-	-	13.0	
6.9	7.7	7.8	0.18	.028		-	-	-	-	12.0	
7.5	8.5	8.7	0.15			1				11.7	
7.8	8.7	8.9	0.12			2				11.3	
7.8	8.6	8.8	0.08							11.0	

5A1a CATION EXCHANGE CAPACITY NH4, Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	6E2b								
	6E2b Ca	6E2b Mg	6E2b H	6E2b Na	6E2b K				
20.3	12.7	4.7		0.1	1.6	94	19.1	2.7	
24.1	16.5	6.1		0.1	1.4	100	24.1	2.7	
25.0	16.4	5.5		0.2	1.5	94	23.6	3.0	
23.1	20.8	5.3		0.2	1.8	100	28.1	3.9	
22.4				0.2	2.1				
22.1				0.2	2.2				

a. Particle size analyses by Beltsville Laboratory.
b. Organic matter in sand fractions.

Soil type: Kenesaw silt loam

Soil No.: S54Nebr-41-1-(1-6)

Location: 400 feet west and 130 feet south of northeast corner Sec. 7, T11N, R7W; 3 miles east and 3 miles north of Phillips, Hamilton County, Nebraska.

Topography: About 2 percent southeast facing slope in undulating loess-mantled plain.

Land use: Cultivated, wheat 1954.

Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- 2374 A_{1p} 0-7" Grayish brown (10YR 5/2, dry) to very dark grayish brown (10YR 3/2, moist) silt loam; moderate fine granular structure; slightly hard, dry; friable, moist; under tillage breaks out in medium and coarse blocky clods after fields are dried out; abrupt smooth lower boundary.
- 2375 B₂ 7-15" Pale brown (10YR 6/3, dry) to grayish brown (10YR 4/2.5, moist) light silty clay loam; a few fine dark brown spots of accumulated iron segregation; compound moderate coarse prismatic and medium blocky structure; with vertical cleavage somewhat better defined; hard, dry; firm, moist; fairly numerous pores and root channels; gradual smooth lower boundary.
- 2776 B₃ 15-24" Very pale brown (10YR 7/3, dry) to pale brown (10YR 6/3, moist) heavy silt loam; common prominent yellowish brown and dark brown mottles; compound coarse prismatic and coarse blocky structure; hard, dry; friable, moist; numerous root channels, pores and a few worm burrows; clear wavy lower boundary. In places the noncalcareous material tongues 6 or more inches into the B_{ca} horizon along the major vertical cracking planes.
- 2377 B_{ca} 24-33" Very pale brown (10YR 7.5/3, dry) to light yellowish brown (10YR 6/4, moist) silt loam; common faint and prominent fine yellow and brown mottles; compound weak coarse prismatic and very weak coarse blocky structure; slightly hard, dry; friable, moist; calcareous and strong effervescence mainly in spots and seams of lime carbonate accumulation; fairly numerous pores and root channels; clear smooth lower boundary.
- 2378 C_{ca} 33-48" Very pale brown (10YR 8/3, dry) to pale brown (10YR 6/3, moist) silt loam; few faint fine pale yellow and light brown mottles; massive; but has some weak vertical cleavage plains; calcareous, including much white lime accumulation in spots and seams; violent effervescence; gradual smooth lower boundary.
- 2379 C 48-60" Pale yellow (2.5Y 8/3, dry) to light yellowish brown (2.5Y 6/3, moist) silt loam; few faint fine yellowish brown, strong brown and dark brown mottles and iron accumulation; massive; soft, dry; very friable, moist; calcareous, including a few white lime spots and streaks; fairly numerous thread-like pores and a few root channels.

NOTE: Soils at this location were mapped Colby fine sandy loam in the Hamilton County Soil Survey, Bureau of Chemistry and Soils, 1927.

Soil type: *Keota silt loam
 Soil No.: S53Nebr-79-3-(1-6)
 Date Sampled: September 30, 1953
 Location: Four hundred feet west and 1375 feet south of NE corner Sec. 16, T22N R56W, Scotts Bluff County, Nebraska.
 Topographic position: Foot slope.
 Relief: Slight, smooth 4-5 percent slope, northeast facing.
 Drainage: Well drained.
 Ground water: Many feet to water level.
 Root distribution: Normal throughout. No evidence of limiting horizons.
 Land use: Irrigated from ditch--beans 1953. Harvested prior to sampling. Farmer reports 50 bushel yield. 1953 first crop after alfalfa. Described by: John Elder.

Mandan

Lab.No.	Horizon	
1953	Alp	0-8 inches. Grayish brown (10YR 5.5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam. Weak medium subangular blocky to very fine, very weak granular, slightly hard dry, friable moist, slight effervescence, grades abruptly and smoothly.
1954	Al2	8-16 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to very weak fine granular, slightly hard dry, friable moist, violent effervescence, no coatings on aggregates, gradual, smooth boundary.
1955	C1	16-24 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) loam. Very weak coarse subangular blocky to very weak fine granular, soft dry, very friable moist, contains a few slightly hard pieces (1/8-1/4 inch) of Brule fragments, violent effervescence; diffuse, smooth boundary.
1956	C2	24-34 inches. Pinkish white (7.5YR 8/2 dry) to pink (7.5YR 7/4 moist) silt loam. Massive to single grain with many medium to small soft lumps and powdery material after crushing, soft dry, very friable moist, violent effervescence; diffuse, smooth boundary.
1957	C3	34-43 inches. Pinkish white (7.5YR 8/2 dry) to pink (7.5YR 7/4 moist) silt loam. Massive to single grain with many medium and small soft lumps and powdery material after crushing, soft dry, very friable moist, violent effervescence; diffuse, smooth boundary.
1958	C4	43-60 inches. Pinkish white (7.5YR 8/2 dry) to pink (7.5YR 7/4 moist) very fine sandy loam. Massive breaking to single grain, soft dry, very friable moist, violent effervescence, continuing below 60 inches to an undetermined depth.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE ^{*Keota} silt loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-5-(1-8) **LAB. NOS.** 1965-1972

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											2A2 > 2
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	3A1		
2.1	1.0-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002					
0-6	Alp1	-	0.6	1.5	5.8	34.3	37.4	20.4	59.8	15.9	-	1	
6-9	Alp2	-	0.5	1.1	6.0	27.1	51.5	13.8	56.0	26.7	-	sil	
9-15	Al2	-	0.5	1.4	5.6	32.0	40.0	20.5	57.9	17.9	-	1	
15-29	C1	-	1.2	2.1	6.8	25.2	51.0	13.7	55.9	24.7	-	sil	
29-38	C2	-	1.3	1.4	4.8	22.3	57.6	12.6	56.9	26.2	-	sil	
38-44	C3	0.7	2.0	1.9	5.7	17.6	58.8	13.3	51.0	29.0	-	sil	
44-51	C4	0.2	1.0	1.2	4.7	22.0	59.7	11.2	58.1	26.8	-	sil	
51-60	C5	0.2	0.6	0.9	4.3	22.7	60.4	10.9	58.8	27.1	-	sil	
		pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a	8C1a	6A1a								1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:5	1:10		ORGANIC CARBON %	NITRO-GEN %	C/N	ESTS SALT (BUREAU CUP)		CoCO ₃ equiv-olent %	GYP SUM me./100g. SOIL				4E2
7.7	8.2	8.5	1.19			a	1.0	-					12.6
7.8	8.2	8.4	0.99				1.3	-					12.8
7.6	8.3	8.5	0.63				2.0	8					15.2
7.7	8.4	8.6	0.34				2.4	11					13.7
7.8	8.8	9.0	0.13				2.2	9	-				13.5
7.9	9.2	9.3	0.10				1.9	15	-				14.4
8.0	9.4	9.5	0.09				1.6	9	-				13.0
8.1	9.3	9.6	0.06				1.6	8	-				13.0
	5A1a	5B1a	CATIONS		5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A		
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE				6P1a	6Q1a			MOISTURE AT SATURATION %		
	Ca	6O2b Mg	6P2a Na	6Q2a K	EXCH. No %								
	milliequivalents per 100g. soil		milliequivalents per 100g. soil				← milliequivalents per liter →						
25.4		4.3	0.3	3.7	1		3.8	2.0			48.2		
25.7		4.0	0.7	3.3	3		5.5	1.6			52.7		
26.0		3.7	0.8	1.6	3		7.8	0.6			54.0		
24.2		4.8	0.8	2.7	3		9.4	1.4			49.1		
25.5		7.1	1.8	4.0	7		13.4	1.8			50.1		
25.7		7.6	3.1	4.1	12		14.5	1.2			48.1		
24.9		6.8	3.6	3.9	14		13.8	1.0			45.7		
25.1		6.4	4.6	3.8	18		14.1	0.8			43.2		

a. Less than 0.20%

Soil type: *Keota silt loam

Soil No.: S53Nebr-79-5-(1-8)

Date sampled: October 1, 1953

Location: 0.4 miles south and 0.7 miles east of NW corner Sec. 22, T22N R57W, Scotts Bluff County, Nebraska.

Topographic position: Foot slope.

Described by: John Elder.

Relief: Slight, smooth 3 percent slope, southwest facing.

Drainage: Well drained. Sample site is about 100 feet below irrigation ditch (not a large supply canal).

Ground water: Many feet to water level.

Root distribution: Normal throughout. No evidence of limiting horizon.

Land use: Irrigated from ditch--beans 1953. Crop harvested but no yield available.

Mandan

Lab.No.	Horizon	Description
1965	Alp1	0-6 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam. Weak medium subangular blocky to very weak very fine granular, hard dry, friable moist, few fine white lime spots, matrix noncalcareous; abrupt, smooth boundary.
1966	Alp2	6-9 inches. Variegated color. Pale brown and grayish brown (10YR 6/3-5/2 dry) to grayish brown and dark grayish brown (10YR 5/2 and 4/2 moist) silty clay loam. Moderate coarse subangular blocky to moderate fine granular, hard dry, friable moist, darker material noncalcareous, lighter material violent effervescence, abrupt smooth boundary.
1967	Al2	9-15 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to weak fine granular, slightly hard dry, friable moist, a few worm openings and worm casts, violent effervescence, gradual, smooth boundary.
1968	C1	15-29 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to very weak fine and very fine granular, soft dry, very friable moist, violent effervescence, many fine white lime spots, grades gradually and smoothly.
1969	C2	29-38 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Very weak coarse subangular blocky to very weak fine and very fine granular, soft dry, very friable moist, violent effervescence, few fine white lime spots in pores and openings, a few slightly hard Brule fragments are present. Abrupt, irregular boundary.
1970	C3	38-44 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam, very weak medium and coarse subangular blocky to moderate fine granular, soft dry, very friable moist, few fine white lime specks in pores and openings, many slightly hard Brule fragments and an occasional quartz pebble; this is probably an old surface; clear, wavy boundary.
1971	C4	44-51 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Very weak coarse subangular blocky to moderate fine granular, soft dry, very friable moist, violent effervescence, thin lime coating on sides of some pore and root openings, a few hard Brule fragments. Diffuse, wavy boundary.
1972	C5	51-60 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Massive or very weak coarse subangular blocky with tendency to break to weak fine granules as well as single grain, soft dry, very friable moist, violent effervescence, continues downward to undetermined depth.

Note: Pink Brule chips (7.5YR 7/4 moist) are present in the lower horizons (29 inches plus) giving the viald samples a faint pinkish cast. In profile S53Nebr-79-3, Keota silt loam, the corresponding horizons have colors which best match the 7.5YR chart.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Lamoure LOCATION Dodge County, Nebraska
 silty clay loam

SOIL NOS. 953Nebr-27-3-(1-8) LAB. NOS. 1518-1525

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a	3A1					2A2				
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			> 2	
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	< 19mm	
0-6	Alp	-	0.5	1.3	5.1	21.1	51.0	21.0	61.2	14.5	-	s11
6-18	Al2	0.4	1.9	4.0	13.3	14.3	42.7	23.4	50.2	15.2	-	1
18-25	AC	1.4	1.9	3.6	14.4	10.6	37.4	30.7	42.4	14.8	-	c1
25-33	C1	1.1	1.6	2.6	14.3	11.1	37.5	31.8	44.0	13.9	Tr.	c1
33-40	C2	1.4	1.6	2.6	15.2	13.4	38.4	27.4	50.4	11.5	1	c1
40-44	C3	1.8	1.5	2.4	14.5	14.0	42.4	23.4	54.5	11.4	2	1
44-48	Ccag	2.0	1.4	2.0	13.1	11.7	47.6	22.2	53.2	14.3	Tr.	1
48-57	Cg	-	0.7	2.8	11.9	9.8	43.5	11.3	63.4	18.1	-	1

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a			EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMOS PER CM	CoCO ₃ equivalent	GYPSUM no./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N		8A1a	%		%	%	%
6.6	7.0	7.0	1.27			a	4.6	-				10.7
7.9	8.3	8.4	0.59				1.8	1				11.6
8.2	6.5	8.6	0.38				1.4	3				14.9
8.2	8.6	8.6	0.29				1.2	2	-			15.8
8.2	8.5	8.5	0.22				1.1	1	-			14.1
8.1	8.3	8.5	0.17				1.1	2	-			15.3
8.3	8.6	8.6	0.16				1.0	17	-			9.8
7.9	8.0	8.2	0.05				1.0	-	-			6.4

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	5B1a EXTRACTABLE		CATIONS EXCHANGEABLE		5D2	8A1 SATURATION EXTRACT SOL.		8A MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	EXCH. Na %	6P1a No	6Q1a K	
	milliequivalents per 100g. soil					milliequivalents per liter		
21.2	13.1	7.2	0.4	0.8	2	4.1	0.5	45.4
20.5	14.5	9.7	1.3	0.3	6	10.6	0.1	48.5
24.4			2.2	0.5	9	10.2	-	62.9
23.6			2.2	0.5	9	9.3	0.1	67.5
20.6			1.9	0.5	9	7.6	0.1	64.3
17.9			1.6	0.6	9	7.0	0.1	55.4
12.8			1.1	0.4	8	5.9	0.1	45.8
10.4	6.3	3.7	0.9	0.4	9	5.6	0.1	34.9

a. Less than 0.20%.

Soil type: **Imoure silty clay loam**

Soil No.: **S53Nebr-27-3-(1-8)**

Location: **One hundred feet east of center of Sec. 8, T17N, R7E, Dodge County, Nebraska.**

Topographic position: **Platte River bottom land, slack-water sediment area some distance from river on flat to slightly depressed position, with possible flooding from upland drains.**

Relief: **Flat, no surface drainage except that provided by road ditches.**

Drainage: **Surface drainage lacking, profile poorly drained.**

Ground water: **Water table about 57 inches at time of sampling.**

Land use: **Cultivated.**

Described by: **B. H. Williams and Donald C. Yost.**

Mandan

Lab. No.	Horizon	Description
1518	Alp	0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam; coarse cloddy subangular blocky separating to moderate medium and fine granular; slightly hard, dry; friable, moist; noncalcareous; abrupt smooth lower boundary.
1519	Al2	6-18 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam; weak coarse subangular blocky separating to strong medium and fine granular; slightly hard, dry; slightly plastic, wet; matrix noncalcareous but with many fine, soft, white, lime concretions in larger pores and openings; clear smooth lower boundary.
1520	AC	18-25 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silty clay; few faint brown mottles and stains; moderate coarse prismatic separating easily to strong fine blocky; hard, dry; plastic, wet; weak effervescence, lime is in faint coating on pore opening with a few fine, white concretions; clear smooth lower boundary.
1521	C1	25-33 inches. Gray (10YR 5/1 dry) to dark gray (10YR 4/1 moist) silty clay; few distinct fine brown mottles; moderate coarse prismatic breaking to strong medium blocky; firm, moist; hard, dry; plastic, wet; very weak effervescence, a few hard lime concretions up to 1/2 inch in diameter; clear smooth lower boundary.
1522	C2	33-40 inches. Gray (10YR 5/1 dry) to dark gray (10YR 4/1 moist) silty clay loam; common distinct fine to coarse brown mottles and stains; moderate medium prismatic breaking to strong medium blocky; hard, dry; firm, moist; plastic, wet; weak effervescence, few hard lime concretions; clear smooth lower boundary.
1523	C3	40-44 inches. Grayish brown (2.5Y 5.5/2 dry) to dark grayish brown (2.5Y 4/2 moist) silty clay loam; many distinct fine and coarse brown mottles; weak medium blocky separating to moderate fine granular; hard, dry; firm, moist; plastic, wet; weak effervescence, many hard lime concretions, clear smooth lower boundary.
1524	Ccag	44-48 inches. White (10YR 8/1 dry) to light brownish gray (10YR 6/2 moist) silty clay loam; many distinct brown mottles and soft brown concretions; weak fine granular; violent effervescence; clear smooth lower boundary.
1525	Cg	48-57 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2 moist) silt loam; massive, slightly hard, dry; friable, moist; noncalcareous; clear smooth boundary to fine sand below 57 inches which gradually grades to sand.

Note: Horizons 1 and 2 may be later deposition over an older soil. In many respects this soil is characteristic of Silver Creek soils but the "Cca" horizon is at greater depth and the soil is developed in younger materials, under poorer drainage.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Lehara silt loam LOCATION Dodge County, Nebraska

SOIL NOS. 853Nebr-27-4-(1-8) LAB. NOS. 1526-1533

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											2A2
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 < 19mm		
0-6	Alp	0.1	0.3	0.8	8.2	14.4	59.0	17.2	64.2	15.6	-	sil	
6-16	Al2	-	0.6	1.3	7.2	11.1	54.8	25.0	51.2	20.1	-	sil	
16-23	AC	-	0.7	1.9	10.8	12.9	48.3	25.4	50.8	18.5	-	1	
23-30	Cca	0.2	1.3	3.4	20.3	17.9	36.8	20.1	56.5	13.4	-	1	
30-36	C2	0.2	2.5	5.7	32.6	24.7	22.2	12.1	66.8	5.1	Tr.	fsl	
36-45	C3	0.4	3.3	7.9	37.4	25.7	18.0	7.3	67.7	4.0	Tr.	fsl	
45-54	G1	0.5	3.5	8.4	40.1	25.5	15.8	6.2	67.7	2.8	Tr.	lfs	
54-60	G2	0.3	3.6	9.5	40.6	26.0	14.2	5.8	67.6	1.9	Tr.	lfs	
8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRI- CAL CONDUCT- IVITY EC x 10 ³ MILLIMHOS PER CM	6E1a	6F1a	MOISTURE TENSIONS			
	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	NITRO- GEN %	C/N	EST% SALT (BUREAU CUP)	8A1a	CoCO ₃ equiv- alent %	GYPSSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %	
6.8	7.1	7.1	1.65			a	1.9	-				10.0	
7.8	8.2	8.4	1.40				0.7	2				14.5	
8.2	8.5	8.6	0.87				0.8	8				13.7	
8.2	8.7	8.8	0.36				0.8	9	-			10.1	
8.2	8.8	8.8	0.18				1.0	5	-			5.9	
7.8	8.0	7.9	0.07				1.0	1	-			4.1	
7.4	7.6	7.4	0.05				0.8	-	-			3.6	
7.5	7.4	6.9	0.03				0.7	-	-			3.1	
5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	5B1a CATIONS				5B1b	5D2 EXCH. No %	6A1 SATURATION		EXTRACT SOL.		8A MOISTURE AT SATU- RATION %		
	EXTRACTABLE		EXCHANGEABLE		EXCH. No		6P1a No	6Q1a K	Ca/Mg				
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K									
	← milliequivalents per 100g. soil →					← milliequivalents per liter →							
21.1	15.8	4.6	0.4	1.6	2	0.6	2.3			44.5			
23.8			0.6	1.5	2	0.6	0.5			58.7			
18.2			0.7	1.5	4	1.7	0.5			55.6			
12.2			0.6	1.2	5	3.3	0.8			46.6			
7.8			0.6	0.8	8	4.8	0.5			34.1			
7.0			0.5	0.6	7	4.3	0.8			28.2			
6.4	3.8	2.6	0.4	0.5	6	3.3	0.4			24.0			
5.2	3.5	1.8	0.6	0.3	12	2.4	0.5			24.8			

a. Less than 0.20%.

Soil type: Ieshara silt loam

Soil No.: S53Nebr-27-4-(1-8)

Location: 0.2 mile south of NW corner Sec. 11, T17N, R6E, Dodge County, Nebraska.

Topographic position: Flat to slightly depressed Platte River bottom land position. Above flood level of the River.

Relief: Slight.

Drainage: Imperfectly or poorly drained. Surface drainage is lacking except as provided by road ditches and a deep drainage ditch about 1 mile northeast of the sample site. The soil shows decided dull color throughout, typical of soils developed under poor drainage. The soil, however, seems moderately permeable above the fine textured material at 70 inches.

Ground water: Saturated below 54 inches but this water may be held above the fine textured material at 70 inches and may not indicate the static water level.

Land use: Cultivated. Good soybean, corn and sorghum crops at and near the sample location. About .1 mile north of the sample site crops are uneven in growth and show evidence of saline or alkali conditions.

Described by: B. H. Williams and Donald C. Yost.

Mandan

Tab.No. Horizon

1526	Alp	0-6 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) heavy silt loam; moderate fine and very fine granular; slightly hard, dry; friable, moist; noncalcareous pH 7.0 (Soiltex); abrupt smooth lower boundary.
1527	Al2	6-16 inches. Dark gray (10YR 4/1 dry) to black (10YR 2/1 moist) silty clay loam; weak subangular blocky separating to strong medium and fine granular; hard, dry; friable, moist; numerous medium and fine pores; slightly plastic, wet; noncalcareous or calcareous only in spots; pH 7.5; clear smooth lower boundary.
1528	AC	16-23 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam with gray (10YR 6/1 dry) coatings on the smaller aggregates; massive or weak medium subangular blocky separating to moderate fine and very fine blocky; hard, dry; friable, moist; plastic, wet; numerous lighter colored worm casts from horizon below; violent effervescence, pH 8.5; clear smooth lower boundary.
1529	Cca	23-30 inches. Gray (10YR 6/1 dry) to dark gray (10YR 4.5/1 moist) silty clay loam; moderate medium subangular blocky breaking to moderate fine and very fine blocky; slightly hard, dry; friable, moist; violent effervescence, pH 9.0; root openings and pores are coated or filled with white lime resulting in numerous tubular and rounded soft lime segregations; clear smooth lower boundary.
1530	C2	30-36 inches. Gray (10YR 5.5/1 dry) to dark gray (10YR 4.5/1 moist) loam; few faint fine brown mottles; moderate medium subangular blocky breaking to moderate fine and very fine subangular blocky; slightly hard, dry; friable, moist; violent effervescence, pH 9+; clear smooth lower boundary.
1531	C3	36-45 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4.5/2 moist) fine sandy loam; many coarse distinct brown mottles; massive; slightly hard, dry; very friable, moist; weak effervescence; clear smooth lower boundary.
1532	G1	45-54 inches. Light gray (10YR 7.5/1 dry) to light brownish gray (10YR 6/2 moist) loamy fine sand; many medium and coarse prominent brown mottles, few medium prominent black soft iron concretions; loose, dry; loose, moist; massive; moderately compact in place, breaks to rounded lumps of varying size; noncalcareous; clear smooth lower boundary.
1533	G2	54-60 inches. Light gray (10YR 7/1.5 dry) to light brownish gray (2.5Y 6/2 moist) loamy fine sand; few faint fine yellowish brown mottles; massive; slightly hard, dry; loose, moist; noncalcareous; saturated. This horizon continues to about 70 inches where it rests on gray plastic silty clay.

Note: The subsoil is a little on the heavy side for Ieshara. It is about like Lamoure in subsoil texture to a depth of 30 inches. Below this depth, however, the texture is too coarse for Lamoure.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Leshara LOCATION Hall County, Nebraska
silt loam

SOIL NOS. S53Nebr-40-4-(1-7) LAB. NOS. 1571-1577

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a 3A1 2A2										
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-6	A1p	0.3	0.8	1.1	5.5	12.7	58.0	21.6	58.2	16.2	-	sil
6-10	A12	0.1	0.7	1.0	4.5	11.4	59.4	22.9	56.9	16.9	-	sil
10-15	AC	-	0.2	0.3	0.8	14.0	65.8	18.9	64.5	15.8	-	sil
15-24	C1	0.1	0.1	0.1	0.2	16.3	69.4	13.8	74.9	10.9	-	sil
24-29	A1b	0.5	0.3	0.1	0.5	1.1	57.6	39.9	20.4	38.6	-	sic1
29-36	C1b	0.1	0.1	0.2	5.0	37.9	44.8	11.9	80.6	6.5	-	l
36-48	C2b	-	0.7	1.7	23.0	34.9	25.9	13.8	72.8	6.6	-	vfs1
8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a			EST. SALT (BUREAU CUP)	EC x 10 ³ MILLIMOS PER CM	CoCO ₃ equiv- alent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1.5	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N		0A1a	%		%	%	%
7.9	8.1	8.2	1.88			a	1.5	5				11.8
8.1	8.2	8.3	1.79				0.9	5				13.0
8.3	8.4	8.5	0.64				1.0	5				10.4
8.2	8.5	8.6	0.15				1.2	1	-			7.9
7.9	8.4	8.5	0.39				1.2	2	-			22.0
8.1	8.1	8.1	0.09				1.6	-	-			6.9
7.9	7.8	7.7	0.15				1.6	-	-			6.8
5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	5B1a CATIONS		5B1b EXCHANGEABLE		5D2 EXCH. No %	6A1 SATURATION EXTRACT SOL.		8A MOISTURE AT SATURATION %				
	EXTRACTABLE					6P1a	6Q1a					
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K		Na	K					
	milliequivalents per 100g. soil					milliequivalents per liter						
21.1		6.5	0.3	1.3	1	1.3	0.8	52.8				
21.2			0.5	1.1	2	1.7	0.4	56.5				
16.4			1.0	0.8	6	4.8	0.4	52.5				
14.1			1.4	0.9	10	7.4	0.4	45.2				
34.9		15.0	3.6	2.6	10	8.5	0.4	76.8				
12.7			1.5	1.1	12	11.3	0.5	38.9				
12.0	7.4	3.7	1.1	0.8	9	10.2	0.5	33.5				

a. Less than 0.20%.

Soil type: Leshara silt loam

Soil No.: S53Nebr-40-4-(1-8)

Location: 0.3 mile south of NE corner Sec. 2, T10N, R10W, Hall County, Nebraska.

Topographic position: Platte River bottom land, slightly lower than the alluvial to the north, farther from river.

Relief: Slight.

Drainage: Imperfectly drained.

Ground water: Water table at 48 inches in July. Probably fluctuates between 3 and 6 feet during the growing season.

Land use: Cultivated.

Described by: B. H. Williams and Donald C. Yost.

Mandan

Lab.No.	Horizon	
1571	Alp	0-6 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate fine and very fine granular; slightly hard, dry; friable, moist; strong effervescence, abrupt smooth lower boundary.
1572	Al2	6-10 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate medium and fine granular; slightly hard, dry; friable, moist; violent effervescence; numerous very fine and a few large pores and root channels; clear smooth lower boundary.
1573	AC	10-15 inches. A horizon of intense earthworm action resulting in about equal proportions of gray and dark gray (10YR 5/1 and 4/1 dry) to dark gray and very dark gray (10YR 4/1 and 3/1 moist) silt loam; moderate fine and very fine granular; slightly hard, dry; friable, moist; violent effervescence; clear smooth lower boundary.
1574	Cl	15-24 inches. Light gray (2.5Y 7/2 dry) to light brownish gray (2.5Y 6/2 moist) silt loam; moderate medium and fine crumb; slightly hard, dry; friable, moist; strong effervescence; streaks and spots; clear smooth lower boundary.
1575	Alb	24-29 inches. Gray (10YR 5.5/1 dry) to dark gray (10YR 4/1.5 moist) silty clay loam; few faint fine brown mottles; weak subangular blocky breaking to moderate fine and very fine subangular blocky; hard, dry; friable, moist; slightly plastic, wet; noncalcareous except for worm casts; clear smooth lower boundary.
1576	Clb	29-36 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) very fine sandy loam or loam; many distinct coarse brown and yellow mottles and stains and a few coarse dark brown soft concretionary iron spots; massive, breaking to rounded lumps; soft, dry; very friable, moist; noncalcareous; clear smooth lower boundary.
1577	C2b	36-48 inches. Similar to horizon above with many prominent coarse brown mottles including concentric staining around root channels that is very dark brown along the opening and grades outward to pale brown or yellowish brown; saturated; noncalcareous; roots from nearby cottonwood trees penetrate to the coarse material below; abrupt lower boundary.
	D	48+ inches. Not sampled for Mandan laboratory. Light gray (10YR 7/2 dry) coarse clean sand and fine gravel. Water table in this layer and in contact with the silty material above when sampled in June 1953.

SOIL SURVEY LABORATORY Mandan, N. Dak.

OIL TYPE Leshara LOCATION Merrick County, Nebraska
silt loam

SOIL NOS. S53Nebr-61-1-(1-5) LAB. NOS. 1544-1548

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (19mm)		
0-8	Alp	0.1	0.6	1.4	8.1	20.2	50.6	19.0	64.0	13.0	-	sil	
8-14	AC	-	0.4	0.7	9.8	16.6	51.9	20.6	64.8	12.4	-	sil	
14-22	Al1b	0.2	2.9	4.8	10.0	13.1	37.5	31.5	40.8	15.6	-	cl	
22-32	Al2b	0.8	7.0	8.8	15.8	13.8	26.1	27.7	39.1	8.8	-	sc1	
32-39	D	2.0	0.4	21.9	21.0	13.5	26.0	15.2	41.9	7.7	Tr.	fs1	
pH		ORGANIC MATTER				8A2	ELECTRI- CAL CONDUCT- IVITY EC - 10 ³ MILLIMHOS PER CM 8A1a	6E1a	6F1a	MOISTURE TENSIONS			4B2
8C1b SATU- RATED PASTE	8C1a	8C1a	6A1a			EST% SALT (BUREAU CUP)	CoCO ₃ equiv- alent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.		
	1:5	1:10	ORGANIC CARBON %	NITRO- GEN %	C/N		%	%	%	%	%	%	
7.4	7.8	7.9	1.97			a	1.3	1				10.3	
8.0	8.4	8.6	1.12				0.6	4				10.8	
8.1	8.3	8.6	1.52				0.7	9				15.6	
8.1	8.4	8.6	0.80				1.2	10	-			11.9	
7.9	8.3	8.3	0.18				1.9	1	-			7.3	
5A1a	5B1a	CATIONS			5B1b	5D2	SATURATION EXTRACT SOL.				8A		
CATION EXCHANGE CAPACITY MEq./Ac	EXTRACTABLE		EXCHANGEABLE		EXCH. No %	6P1a	6Q1a	← milliequivalents per liter →			MOISTURE AT SATU- RATION %		
	Ca	6Q2b Mg	6P2a Na	6Q2a K		No	K						
← milliequivalents per 100g. soil →													
22.7		5.0	0.4	1.7	2	0.4	1.5				47.6		
17.8		6.2	0.6	1.1	3	0.6	0.5				51.9		
21.5			0.7	0.8	3	1.7	0.4				59.1		
15.1			1.1	0.6	7	4.8	0.4				52.5		
11.8		5.3	1.0	0.5	8	9.3	0.4				39.0		

a. Less than 0.20%.

Soil type: Leshara silt loam
 Soil No.: 853Nebr-61-1-(1-5)
 Location: 0.15 mile south of NE corner Sec. 2, T12N, R7W, Merrick County, Nebraska.
 Topographic position: Platte River bottom land above flood level.
 Relief: Slight
 Drainage: Imperfectly or poorly drained.
 Ground water: Three and one-half to 6 feet below the surface depending on the season.
 Land use: Cultivated.
 Described by: B. H. Williams and Donald C. Yost.

Mandan		
Lab. No.	Horizon	
1544	Alp	0-8 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate fine and very fine granular; soft, dry; friable, moist; very weak effervescence, pH 7.5 (Soiltex); clear smooth lower boundary.
1545	AC	8-14 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; weak medium sub-angular blocky separating to strong fine and very fine granular; slightly hard, dry; friable, moist; strong effervescence, pH 8.0; clear smooth lower boundary.
1546	Allb	14-22 inches. Dark gray (10YR 4.5/1 dry) to very dark gray (10YR 3/1 moist) silty clay loam, with some slightly lighter colored worm casts; weak fine subangular blocky separating to strong fine and very fine granular; slightly hard, dry; slightly plastic, wet; violent effervescence; clear smooth lower boundary.
1547	Al2b	22-32 inches. Gray (10YR 5/1 dry) very dark gray (10YR 3/1 moist) silty clay loam; moderate fine subangular blocky separating to strong medium and fine granular; slightly hard, dry; plastic, wet; violent effervescence; clear smooth lower boundary.
1548	D1	32-39 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) sandy loam; common coarse prominent brown mottles and stains common; weak medium and fine granular; very weak effervescence in spots; abrupt smooth lower boundary.
	D2	39+ inches. Coarse sand with some fine gravel, not sampled.

Note: This profile is on the heavy side, in third and fourth horizons, for Leshara but probably is best classed with this series rather than the Lamoure soils, which is the only alternative series at present. In the general area of this location, at least part of the soils are silty throughout. They are moderately permeable but drainage is restricted by the high water table (3½ to 6 feet, depending on the season). Occasional slick or "alkali" spots occur in these soils in the general area where sampled.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Ieshara LOCATION Saunders County, Nebraska
silt loam

SOIL NOS. 853Hebr-78-3-(1-8) LAB. NOS. 1490-1497

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a		3A1					2A2				
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2				
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002					
0-6	Alp	-	-	-	0.5	18.1	64.4	17.0	68.4	14.4	-	sil	
6-10	Al2	-	-	-	0.2	17.1	63.2	19.5	65.3	15.2	-	sil	
10-13	AC	-	-	-	0.2	18.4	64.2	17.2	70.0	12.8	-	sil	
13-19	C1	-	-	0.2	1.0	27.5	60.4	10.9	77.0	11.6	-	sil	
19-26	C2	-	-	0.1	0.3	22.7	67.6	9.3	77.1	13.4	-	sil	
26-32	Cca	0.2	0.3	0.1	0.2	4.5	78.2	16.5	45.1	37.7	-	sil	
32-46	C3	-	-	0.1	0.6	27.5	65.6	6.2	84.6	8.9	-	sil	
46-52	Cg or G	0.1	0.1	0.1	0.9	4.6	48.4	45.8	25.8	28.0	-	sic	
SOIL SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS			
	8C1a	8C1a	6A1a	NITROGEN	C/N	EST% SALT (BUREAU CUP)	EC · 10 ³ MILLIMHOS PER CM @ 25°C	CoCO ₃ equivalent	GYP SUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
	1:5	1:10	%	%				%		%	%	%	
6.2	6.5	6.5	1.31			a	0.6					8.8	
5.9	6.2	6.3	1.18				0.4					11.0	
6.3	6.5	6.5	0.74				0.4		-			9.0	
6.4	6.7	6.7	0.31				0.4		-			6.4	
7.0	7.1	7.0	0.24				0.4		-			5.8	
7.9	8.4	8.5	0.46				0.6	4	-			10.9	
8.0	8.5	8.6	0.08				0.6	1	-			4.5	
7.7	8.5	8.6	0.82				0.7	3	-			24.4	
CATION EXCHANGE CAPACITY NH ₄ Ac	5A1a		5B1a		5B1b		5D2		8A1 SATURATION EXTRACT SOL.			8A	
	EXTRACTABLE		EXCHANGEABLE						6P1a	6Q1a	Ca/Mg		MOISTURE AT SATURATION
	6N2b	6O2b	6P2a	6Q2a			EXCH. Na %					%	
	Ca	Mg	Na	K									
	milliequivalents per 100g. soil							milliequivalents per liter					
17.0	11.4	3.9	0.1	1.3	-	0.2	1.2					42.8	
19.4	12.5	4.2	0.4	0.9	2	0.2	0.4					47.8	
16.3	11.2	4.1	0.4	0.6	2	0.4	0.4					47.3	
11.7	8.6	3.6	0.2	0.3	2	0.6	0.1					41.1	
11.1	7.4	3.6	0.5	0.4	4	1.3	0.1					41.8	
18.8		7.5	0.5	0.8	3	2.2	-					50.8	
9.0		4.8	0.5	0.3	6	3.3	0.1					40.8	
34.2		16.8	2.1	1.0	6	5.0	0.1					74.3	
a. Less than		0.20%											

Soil type: Leshara silt loam

Soil No.: S53Nebr-78-3-(1-8)

Location: Five hundred feet south of north 1/4 corner Sec. 25, T13N, R9E, Saunders County, Nebraska.

Topographic position: Flatte River bottomland above flood level of the river but may be occasionally flooded by local runoff.

Relief: Slight, sample site in broad slight swale.

Drainage: Imperfectly drained.

Ground water: Depth to the water table about 5 feet. Probably rises to within 3½ feet of the surface during wet seasons.

Land use: Cultivated. Crop growth uneven due to presence of "slick spots" and possibly free salts.

Described by: B. H. Williams and Donald C. Yost.

Mandan

Lab. No. Horizon

- 1490 Alp 0-6 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; noncalcareous, pH 7.2; abrupt smooth lower boundary.
- 1491 A12 6-10 inches. Gray (10YR 5/1.5 dry) to very dark grayish brown (10YR 3/2 moist) silt loam with some lighter colored worm casts; strong medium and fine granular; slightly hard, dry; friable, moist; noncalcareous, pH 7.0; clear smooth lower boundary.
- 1492 AC 10-13 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam with some darker colored worm casts; moderate medium and fine granular; slightly hard, dry; friable, moist; noncalcareous, pH 7.0; clear smooth lower boundary.
- 1493 C1 13-19 inches. Light brownish gray (10YR 6.5/2 dry) to grayish brown (10YR 5/2 moist) silt loam; many prominent fine brown mottles and stains; moderate medium and fine granular; soft, dry; friable, moist; many fine and medium pores and root openings; calcareous, pH 7.0; clear smooth lower boundary.
- 1494 C2 19-26 inches. Light gray (2.5Y 7/2 dry) to grayish brown (2.5Y 5/2 moist) silt loam; common distinct fine brown mottles; massive or very weak coarse subangular blocky; soft, dry; very friable, moist; noncalcareous, or calcareous only in spots, pH 7.5 (Soiltex); clear smooth lower boundary.
- 1495 Cca 26-32 inches. Light brownish gray (2.5Y 6/2 dry) to dark gray (2.5Y 4/1 moist) silt loam, stratified with thin lenses of lighter colored silt loam or very fine sandy loam; weak fine granular; soft, dry; friable, moist; violent effervescence, pH 9.0; many white lime spots and small soft concretions; clear smooth lower boundary.
- 1496 C3 32-46 inches. Light gray (2.5Y 7.5/2 dry) to light brownish gray (2.5Y 6/2 moist) very fine sandy loam; common distinct fine and coarse brown mottles; massive; soft, dry; very friable, moist; weak effervescence; pH 9 plus; abrupt lower boundary.
- 1497 Cg or G 46-52 inches. Stratified dark gray and light gray (10YR 4/1 and 7/1 dry) to nearly black and light brownish gray (10YR 2/1.5 and 6/2 moist) silty clay or silty clay loam; common faint fine brown mottles; weak medium subangular blocky separating to strong medium and fine granular; hard, dry; firm, moist; strong effervescence, pH 9.0; pores and openings coated with white lime; clear smooth lower boundary to the dark colored surface horizon of a buried soil.
- 52-60+ inches. No sample taken of this horizon. Very dark gray or black silty clay loam buried soil.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Luton LOCATION Washington County, Nebraska
silty clay

SOIL NOS. S57Nebr-89-1-(1-8) LAB. NOS. 6255-6262

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
		1B1a	2.1	1.0-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	SILT	CLAY	2A2	
0-6	Alp	-	-	-	0.2a	0.5a	53.4	45.9	4.3	49.7	-	sic
6-12	Alb	-	-	-	-	0.4a	44.7	54.9	18.9	26.2	-	sic
12-16	Ccab	0.1	0.1a	0.2a	0.4a	0.5a	24.3	74.4	4.9	20.1	-	c
16-24	Alb2	0.2b	0.7b	0.4b	0.6b	0.5b	35.0	62.6	11.2	24.6	-	c
24-33	Al2b2	0.1b	0.6b	0.3b	0.7b	0.7b	35.1	62.5	9.2	27.0	-	c
33-43	Al3b2	0.7c	0.8c	0.5c	0.9c	0.8c	35.1	61.2	11.6	24.8	-	c
43-50	Clb2	0.2c	0.2c	0.1c	0.1c	0.1c	44.8	54.5	16.1	28.9	-	sic
50-60	Ccab2	-	0.2c	0.1c	0.2c	0.2c	28.7	70.6	3.8	25.2	-	c

8C1a	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a	MOISTURE TENSIONS			4B2
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N	EST. SALT (BUREAU CUP)		CaCO ₃ equiv. elem	GYPNUM mg./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
1:1												
7.8			1.07	.093	11.5	<0.20	0.5	2				25.6
7.8			1.40	.126	11.1	<0.20	0.5	2				25.2
8.0			0.95	.081	11.7	<0.20	0.7	4				25.1
7.9			1.14	.083	13.7	0.24	2.0	2				25.4
7.8			0.91			0.46	4.5	2				25.1
7.8			0.53			0.46	4.6	4				24.4
7.7			0.39			0.46	4.9	4				22.2
7.8			0.42			0.53	5.0	7				26.3

5A1a	EXTRACTABLE CATIONS 5B1a					5D2	8A1 SATURATION EXTRACT SOLUBLE		MOISTURE AT SATURATION %
	602b	6H1a	6P2a	6Q2a	EXCH. No %		6F1a	6Q1a	
	Ca	Mg	H	Na	K		Na	K	
	milliequivalents per 100g. soil						milliequivalents per liter		
44.9	14.6	2.1	0.9	0.9	2	1.5	0.2		
43.8	16.5	2.9	1.2	0.7	2	1.7	0.1		
41.1	18.8	0.8	1.6	0.6	3	2.0	0.1		
45.5	23.2	1.7	2.1	0.7	3	7.8	0.1		
43.2	24.3	2.2	2.7	0.6	3	14.4	0.2		
39.3	23.7	4.4	3.0	0.6	3	16.0	0.2		
33.6	21.8	1.2	2.9	0.8	3	18.0	0.4		
39.7	25.2	0.8	3.9	0.8	4	19.0	0.4		

a. Many irregular light brown concr.
 b. Few smooth dark brown concr. (Fe-Mn?), and common CaCO₃ concr.
 c. Common CaCO₃ concr.
 d. Difficulty dispersing due to gypsum (?); washed extra times.

Soil type: Luton silty clay
 Soil No.: S57(Nebr-89-1-(1-8))
 Location: 175 feet west and 80 feet north of southeast corner of northeast quarter Sec. 28, T20N, R11E, Washington County, Nebraska.
 Physiography: Nearly level Missouri River flood plain, infrequently flooded.
 Relief: 1 to 3 feet.
 Slope: Smooth level, less than 0.5 percent.
 Parent material: Alluvial clays.
 Drainage: Poor; surface drainage has been improved by drainage ditches.
 Permeability: Very slow.
 Salt or alkali: Some CaSO_4 ; much CaCO_3 in Ca horizons; a few shell fragments in calcareous horizons.
 Land use: Cultivated, wheat 1957. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln

Lab. Number

Alp 0 to 6 inches. Black (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) silty clay. Strong fine and medium granular structure; firm, moist; plastic, wet; noncalcareous. Lower 2 inches of horizon is browner (2.5Y 3/2 moist) than the upper 4 inches of the horizon; abrupt smooth boundary.

Alb 6 to 12 inches. Black (10YR 2/1 moist) to very dark gray (2.5Y 3/0 dry) silty clay. Moderate fine blocky breaking to strong fine granular structure; firm, moist; hard, dry; noncalcareous; becomes slightly lighter in color in lower part of horizon; abrupt clear boundary.

Coab 12 to 16 inches. Very dark gray (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) silty clay. Firm, moist; hard, dry; moderate medium blocky breaking to moderate fine and very fine angular blocks; few faint fine light yellowish brown mottles; weak effervescence; numerous large and small CaCO_3 segregations; abrupt clear boundary.

Alb2 16 to 24 inches. Black (10YR 2/1 moist) to black (2.5Y 2/0 dry) silty clay; weak medium blocky breaking to fine and very fine angular blocky; firm, moist; hard, dry; matrix noncalcareous; a few fine segregations of CaCO_3 . Gradual smooth boundary.

Al2b2 24 to 33 inches. Black (10YR 2/1 moist) to very dark gray (2.5Y 3/0 dry) clay; moderate medium and and coarse prismatic breaking to strong fine angular blocky; very firm, moist; very hard, dry; roots are abundant in this horizon but are confined to the faces of the aggregates; few roots go through this horizon; very compact; slickensides present in lower one-third of horizon; matrix noncalcareous; numerous fine and medium CaCO_3 segregations and nests of gypsum crystals common; clear smooth boundary.

Al3b2 33 to 43 inches. Black (10YR 2/1 moist) to very dark gray (2.5Y 3/0 dry) clay, grading to 2.5Y 3/2 moist in lower part; strong gleying; moderate coarse prismatic breaking to strong medium blocky; very firm, moist; very hard, dry; very compact; slickensides present; noncalcareous; a few nests of gypsum crystals present; clear smooth boundary.

Clb2 43 to 50 inches. Very dark grayish brown (2.5Y 3/2 moist) to dark gray (2.5Y 4/1 dry) silty clay with common medium yellowish brown mottles; strong gleying; moderate medium prismatic breaking to strong medium angular blocky; moist, very firm; very hard, dry; few fine CaCO_3 segregations; weak effervescence throughout; few nests of gypsum crystals; gradual smooth boundary.

Coab2 50 to 60 inches. Very dark gray (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) clay; moderate coarse prismatic breaking to moderate medium and fine angular blocky; very firm, moist; very hard, dry; common yellowish brown mottles and many large soft lime segregations; strongly gleyed.

Horizons Alb, Al2b2 and Coab2 were sampled for the Bureau of Public Roads.

SOIL TYPE Luton LOCATION Washington County, Nebraska
silty clay

SOIL NOS. S57Nebr-89-2-(1-8) LAB. NOS. 6263-6270

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY					> 2
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.007	(10mm)		
0-5	Alp	-	0.1a	-	0.1	0.6	37.5	61.7	7.8	30.4	-	c	
5-9	Al2	-	-	-	0.1b	0.4b	28.4	71.1	3.0	25.9	-	c	
9-12	Alb	-	-	-	-	0.3	27.9	71.8	4.5	23.7	-	c	
12-16	Cb	-	-	-	0.1c	0.4c	26.3	73.2	1.8	25.0	-	c	
16-26	Alb2	-	-	-	-	0.4d	32.4	67.2	7.8	25.0	-	c	
26-38	Cb2	0.1	0.1	-	0.1d	0.3d	26.0	73.4	2.5	23.9	-	c	
38-46	Alb3	-	-	-	0.1d	0.4d	34.6	64.9	8.4	26.7	Tr.	c	
46-60	Cgca	0.4b	0.7b	0.2b	0.2b	0.2b	35.1	63.2	6.9	28.5	Tr.	c	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY		6E1a		MOISTURE TENSIONS		
8C1a	1:5	1:10	6A1a	6B1a	C/N	EST% SALT (BU'EAU CUP)	EC · 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv-alent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.	
			%	%			8A1a	%		%	%	%	
7.8			1.57	.135	11.6	<0.20	0.7	2				22.4	
7.9			0.92	.082	11.2	<0.20	0.5	2				25.3	
7.8			1.10	.096	11.4	<0.20	0.5	1				25.9	
7.7			0.74	.065	11.4	<0.20	0.6	2				26.5	
7.6			1.30	.102	12.7	<0.20	0.9	-				25.9	
7.6			0.68			<0.20	1.1	2				27.5	
7.6			1.31			<0.20	1.0	1				25.8	
7.8			0.79			<0.20	1.0	3				25.3	
5A1a		EXTRACTABLE CATIONS				5B1a	5D2		8A1 SATURATION		EXTRACT SOLUBLE		MOISTURE AT SATURATION %
CATION EXCHANGE CAPACITY NH ₄ Ac		6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6F1a	6Q1a					
		Ca	Mg	H	Na	K	Na	K					
		milliequivalents per 100g. soil					milliequivalents per liter						
39.8		8.8	2.1	0.1	1.8	-	0.4	0.4					
41.0		10.8	3.0	0.3	1.0	1	0.5	0.2					
46.1		12.8	3.4	0.4	0.7	1	0.8	0.1					
44.8		13.3	2.9	0.4	1.0	1	0.9	0.2					
45.9		16.9	2.9	1.1	1.2	2	1.6	0.3					
46.1		15.4	2.9	0.7	1.1	1	3.0	0.3					
47.8		18.1	3.4	1.4	0.8	2	3.4	0.2					
43.5		17.2	2.1	1.3	0.8	2	3.2	0.2					

- a. Organic matter.
- b. Few CaCO₃ concr.
- c. Few irregular black concr. (Mn?). Also few CaCO₃ concr.
- d. Common smooth light brown concr. (Fe?). Also few CaCO₃ concr.

Soil type: Luton silty clay
 Soil No.: 857Nebr-89-2-(1-8)
 Location: 300 feet east and 100 feet south of northwest corner Sec. 10, T19N, R11E, Washington County, Nebraska.
 Physiography: Nearly level Missouri River flood plain, infrequently flooded.
 Relief: 1 to 3 feet.
 Slope: Smooth level, less than 0.5 percent.
 Parent material: Alluvial clays.
 Drainage: Poor; surface drainage has been improved by drainage ditches.
 Permeability: Very slow.
 Salt or alkali: No evidence of gypsum crystals; considerable segregated CaCO_3 ; may be saline salts in lower horizons.
 Land use: Cultivated, wheat 1957. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and

Lincoln

Lab. Number

- Alp
6263 0 to 5 inches. Very dark gray (2.5Y 3/1 moist) to dark gray (2.5Y 4/1 dry) silty clay; strong medium and fine granular; firm, moist; hard, dry; weak effervescence; abrupt smooth boundary.
- Al2
6264 5 to 9 inches. Very dark grayish brown (2.5Y 3/2 moist) to dark gray (2.5Y 4/1 dry) silty clay; strong medium and fine granular; firm, moist; hard, dry; weak effervescence; few small fragments (snail) throughout and a few fine flecks of segregated lime in lower inch; abrupt smooth boundary.
- Alb
6265 9 to 12 inches. Very dark gray (2.5Y 3/1 moist) to very dark gray (2.5Y 3/1 dry) silty clay; moderate medium and fine angular blocks breaking to strong fine granules; firm, moist; very hard, dry; noncalcareous matrix with an occasional fleck of segregated lime; clear smooth boundary.
- Cb
6266 12 to 16 inches. Very dark grayish brown (2.5Y 3/2 moist) to very dark gray (2.5Y 3/0 dry) silty clay. Moderate medium blocky breaking to fine and very fine angular blocks; weak to strong effervescence; numerous fine white spots of segregated CaCO_3 ; few calcareous shell fragments; yellowish brown mottles are common, medium and distinct; abrupt smooth boundary.
- Alb2
6267 16 to 26 inches. Black (2.5Y 2/1 moist) to dark gray (2.5Y 4/0 dry) clay; strong medium and fine angular blocky; very firm, moist; very hard, dry; yellowish brown and reddish brown mottles are common, fine and distinct; lower part of horizon has some mixing from horizon below; no effervescence; an occasional iron-manganese pellet 1/8- to 1/4-inch in size; clear smooth boundary.
- Cb2
6268 26 to 38 inches. Very dark grayish brown (2.5Y 3/2 moist) to dark gray (2.5Y 4/0 dry) clay; moderate coarse prismatic breaking to strong medium angular blocky; very firm, moist; very hard, dry; common medium and coarse yellowish brown mottles; no effervescence except on an occasional firm spot of segregated lime in lower 2 inches of the horizon; clear smooth boundary.
- Alb3
6269 38 to 46 inches. Black (2.5Y 2/1 moist) to very dark gray (2.5Y 3/0 dry) clay; moderate medium prismatic breaking to strong medium and fine angular blocky; very firm, moist; very hard, dry; aggregates have shiny coats where moist; matrix is noncalcareous; few fine and medium hard lime concretions; faint yellowish brown mottling but most mottling marked by dark color; abrupt wavy boundary.
- Cgca
6270 46 to 60 inches. Consists of several thin horizons of dark 2.5Y 2/1, moist, and slightly lighter and browner 2.5Y 3/2, moist, clay; horizons represent periods of thin deposition and intervals of soil development. Strong medium and fine angular blocky; very firm, moist; plastic, wet; strong effervescence; numerous fine to coarse spots of segregated lime; few distinct fine and medium yellowish brown mottles; entire horizon appears to be gleyed; free water about 68 inches.

Horizons Alb, Alb2 and CgCa were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9.58

SOIL TYPE Marshall LOCATION Washington County, Nebraska
 silty clay loam

SOIL NOS. S57Nebr-89-5-(1-7) LAB. NOS. 6285-6291

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2		
0-6	Alp	0.1a	-	-	0.1b	2.2b	63.5	34.1	43.1	22.7	-	sic1	
6-9	B1	-	-	-	0.1b	2.2b	63.1	34.6	41.4	24.0	-	sic1	
9-17	B21	-	-	-	0.1b	2.5b	62.9	34.5	41.4	24.1	-	sic1	
17-27	B22	-	-	-	0.2b	3.0b	65.0	31.8	42.4	25.7	-	sic1	
27-42	B23	-	-	-	0.1c	3.2c	67.5	29.2	45.6	25.2	-	sic1	
42-54	B3	-	-	-	0.1c	3.3c	68.1	28.5	46.6	24.9	-	sic1	
54-65	C	-	-	-	0.2c	3.7c	68.9	27.2	47.1	25.6	-	sic1	

8C1a	pH		ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	6E1a		MOISTURE TENSIONS		
	1:5	1:10	6A1a	6B1a	C/N			CaCO ₃ equivalent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
			ORGANIC CARBON %	NITRO- GEN %								
6.1			1.66	.149	11.1							13.6
6.1			1.58	.146	10.8							14.3
6.4			0.98	.094	10.4							14.9
6.6			0.54	.058	9.3							14.0
6.8			0.26									12.6
7.0			0.15									13.2
6.9			0.10									13.2

5A1a	EXTRACTABLE CATIONS					BASE SAT. NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a Sum Bases	5A3a Sum Cations	Vol. Wt. g/cc
	5A2b	6A2b	6H1a	6P2a	5A2a					
	Ca	Mg	H	Na	K					
25.1	14.2	5.6	9.5	-	0.8	82	68	20.6	30.1	
25.1	14.5	5.5	9.5	-	0.7	82	68	20.7	30.2	
25.8	15.7	6.8	7.6	0.1	0.5	90	75	23.1	30.7	
24.4	15.7	6.9	5.6	0.1	0.5	95	80	23.2	28.8	1.28
23.2	15.5	6.7	4.8	0.1	0.4	98	82	22.7	27.5	
23.5	15.7	7.0	4.4	0.2	0.5	100	84	23.4	27.8	
23.7	15.7	7.0	4.0	0.3	0.5	99	85	23.5	27.5	1.26

← milliequivalents per 100g. soil →

5C1 5C3 ← me/100 g. →

4A3a

a. Organic matter,
 b. Many smooth brown porous concr. (Fe-Mn?)
 c. Few irregular brown concr. (Fe-Mn?)

Soil type: Marshall silty clay loam
 Soil No.: 857Nebr-89-5-(1-7)
 Location: .3 mile west and 180 feet south of northeast corner Sec. 30, T18N, R11E, Washington County, Nebraska.
 Physiography: Rolling loess hills, rounded ridge top.
 Relief: 100 to 125 feet.
 Slope: 6 percent east slope.
 Parent material: Peorian loess.
 Drainage: Excessive.
 Permeability: Moderate.
 Salt or alkali: None; lime at 100 inches - segregated - matrix noncalcareous.
 Crop: Plowed stubble. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

Alp 6285	0 to 6 inches. Very dark grayish brown (10YR 3/2 moist) silty clay loam; weak fine and very fine granular; friable, moist; abrupt smooth lower boundary.
B1 6286	6 to 9 inches. Very dark grayish brown (10YR 3/2 moist) silty clay loam; friable, moist; moderate fine and very fine subangular blocky breaking to a moderate fine granular; clear wavy lower boundary; faces of blocks and granules coated with brown film (crushed color 10YR 5/4); worm casts and dark organic staining common.
B21 6287	9 to 17 inches. Dark brown (10YR 4/3 moist) silty clay loam; weak coarse prismatic breaking to a moderately strong fine and very fine subangular blocky; faces of blocks coated and shiny (crushed color is 10YR 5/4); full of worm casts, some of which are stained a very dark grayish brown; clear wavy lower boundary.
B22 6288	17 to 27 inches. Dark brown or brown (10YR 4/3 moist) silty clay loam; moderate coarse to medium prismatic breaking to a weak fine and very fine subangular blocky; faces are coated and shiny when moist; some worm casts; friable, moist; gradual wavy lower boundary.
B23 6289	27 to 42 inches. Light olive brown (2.5Y 5/4 moist) silty clay loam; very friable, moist; weak coarse prismatic breaking to a weak fine and very fine subangular blocky; many medium distinct gray and yellowish brown mottles; many small pores or channels visible; also, many small black specks (probably manganese) visible; some black staining along old root channels or worm channels; gradual wavy lower boundary.
B3 6290	42 to 54 inches. Light olive brown (2.5Y 5/4 moist) heavy silt loam; very friable, moist; weak coarse prismatic breaking to a weak very fine subangular blocky; many medium gray and yellowish brown mottles; many very fine pores or channels visible; some worm casts throughout; many dark manganese specks and black staining in matrix.
C 6291	54 to 65 inches. Light olive brown (2.5Y 5/4 moist) silt loam; very friable; massive; gray and yellowish brown mottles throughout matrix; manganese specks and streaks are more common than in the B3; small pores and channels common. The B3 and C horizons appeared very similar except for slightly developed structure aggregates in the B3; they appeared to have a faint coating in places but were difficult to recognize as blocks even in the B3 horizon. The mottling is similar in the B3 and C except the C has somewhat more gray mottlings and the manganese specks and streaks were more numerous and somewhat larger.

Note: For practical purposes the B3 and C horizons appeared about the same and distinct differences are hard to recognize except on the profile in the pit. In probing deeper, segregated lime was encountered at 100 inches, but the matrix was noncalcareous. Horizons Alp, B22 and C were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Marshall LOCATION Washington County, Nebraska
silty clay loam

SOIL NOS. S57Nebr-89-8-(1-6) LAB. NOS. 6306-6311

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a 3A1										
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2	
0-7	Alp	0.1a	0.1a	-	0.1b	1.8b	67.2	30.7	41.9	27.2	-	sic1
7-15	B21	-	-	-	0.1b	1.9b	64.3	33.7	38.6	27.7	-	sic1
15-25	B22	-	-	-	0.1b	3.2b	64.6	32.1	40.4	27.5	-	sic1
25-37	B23	-	-	-	0.1b	2.7b	67.3	29.9	42.1	28.0	-	sic1
37-47	B3	-	-	-	0.1b	2.8b	67.9	29.2	43.0	27.8	-	sic1
47-60	C	-	-	-	0.1b	3.4b	68.5	28.0	44.4	27.6	-	sic1

pH		ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRI-CAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM	6E1a		MOISTURE TENSIONS		
8C1a	1:5	1:10	6A1a ORGANIC CARBON	6B1a NITRO-GEN			C/N	CoCO ₃ equiv-olem	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.
	1:1		%	%			%		%	%	%
6.2			1.64	.156	10.5						12.7
6.3			0.84	.082	10.2						14.3
6.5			0.43	.048	9.0						13.8
6.7			0.23								13.9
6.8			0.17								13.8
6.9			0.13								13.8

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b Ca	6O2b Mg	6H1a H	6P2a No	6Q2a K	BASE SAT. % NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a Sum Bases	5A3a Sum Cations	4A3a Vol. Wt. g/cc
	← milliequivalents per 100g. soil →					5C1	5C3	← mg/100 g →		
23.3	14.0	4.9	9.1	-	0.8	84	68	19.7	28.8	
24.5	15.9	6.2	8.8	0.1	0.5	93	72	22.7	31.5	
24.2	15.9	6.5	6.0	0.1	0.5	95	79	23.0	29.0	1.26
23.8	16.6	6.3	5.6	0.1	0.4	98	81	23.4	29.0	
23.9	16.8	6.3	4.4	0.2	0.4	99	84	23.7	28.1	
23.6	17.2	6.4	3.6	0.3	0.4	100	87	24.3	27.9	1.23

a. Organic matter.
b. Common smooth brown coner. (Fe-Mn?).

Soil type: Marshall silty clay loam
 Soil No.: 857Nebr-89-8-(1-6)
 Location: 450 feet west and 110 feet north of southeast corner of southwest quarter Sec. 29, T17N, R11E, Washington County, Nebraska.
 Physiography: Rolling loess ridge, east slope.
 Relief: 80 to 100 feet.
 Slope: 6 percent east slope.
 Parent material: Peorian loess (Brown loess).
 Drainage: Excessive.
 Permeability: Moderate to moderately slow.
 Salt or alkali: None; no lime in this location to 120 inches.
 Land use: 1957, oats and sweetclover. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

- Alp 0 to 7 inches. Dark brown (10YR 3/3 dry) to very dark brown (10YR 2/2 moist) silty clay loam; hard, dry; very friable, moist; weak fine to very fine granular; some worm casts and channeling. Lime was added to this field one year ago and these lime fragments were in this horizon; effervescence occurred only on these fragments; clear smooth lower boundary.
- B21 7 to 15 inches. Brown (10YR 4/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; moderate coarse prismatic breaking to a moderate fine and very fine angular blocky; some worm casts and channeling; roots thick in this horizon; faces of blocks are a shiny brown but when crushed are a yellowish brown (10YR 5/4) when dry; clear wavy lower boundary.
- B22 15 to 25 inches. Brown (10YR 5/3 dry) to brown (10YR 4/3 moist) silty clay loam; moderate coarse and medium prismatic breaking to a moderate fine and very fine angular blocky; faces of blocks and prisms have a brown shiny coating but when crushed are a light yellowish brown (10YR 6/4) when dry; many fine pores, channels and worm casts; hard, dry; friable, moist; clear wavy lower boundary.
- B23 25 to 37 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) silty clay loam; weak coarse and medium prismatic breaking to a coarse and medium cloddy or weak coarse and medium angular blocky; many small openings or channels plus worm casts; distinct medium-sized yellowish brown and gray mottles; hard, dry; friable, moist; faces of blocks are shiny; some small to medium iron and manganese concretions and many brown to black specks of iron or manganese; clear wavy lower boundary.
- B3 37 to 47 inches. Pale brown (10YR 6/3 dry) silty clay loam; weak medium to coarse prismatic breaking to weak coarse and medium blocky or cloddy fragments; entire matrix is mottled with gray and yellowish brown so that basic color of matrix is hard to determine; many small and large iron stains and many small specks which are rusty brown to black; dry, hard; very friable, moist; gradual irregular lower boundary.
- C 47 to 60+ inches. Pale brown (10YR 6/3 dry) light silty clay loam; slightly hard, dry; very friable, moist; weak coarse prismatic to massive; entire matrix so mottled with gray and yellowish brown that basic color is difficult to determine; mottlings are many, coarse and distinct; many pores or small channels or openings throughout matrix, many small brownish black and black iron-manganese specks; worm casts or insect workings scattered through matrix.

Note: Borings were made to 120 inches in this hole and no lime was encountered to this depth. The soil material was a continuation of mottled brown loess to 120 inches. The texture also continued as a light silty clay loam. Two samples were taken of this lower loess for correlation--one sample of material from 60 to 100 inches and a second from 100 to 120 inches. Horizons Alp, B22 and C were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Marshall LOCATION Washington County, Nebraska
silty clay loam

SOIL NOS. S57Nebr-89-9-(1-7) LAB. NOS. 6312-6318

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (p-7 cont) 3A1										TEXTURAL CLASS
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			2A2	
		2.1	1.0-5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	> 2	
0-7	Alp	0.2	0.1	0.1	0.2a	1.6a	69.0	28.8	43.1	27.6	-	sic1
7-11	AB	-	-	-	0.2a	1.3a	65.3	33.2	38.0	28.7	-	sic1
11-17	B21	-	-	0.1	0.2a	1.5a	64.7	33.5	37.5	28.8	-	sic1
17-30	B22	-	0.1	0.1	0.2a	2.4a	64.6	32.6	41.0	26.1	-	sic1
30-40	B23	-	-	0.1	0.3a	3.2a	64.5	31.9	43.2	24.7	-	sic1
40-48	B3	-	-	-	0.2a	3.0a	66.6	30.2	40.8	28.9	-	sic1
48-60	C	-	-	-	0.3a	3.1a	69.0	27.6	42.6	29.7	-	sic1
pH		ORGANIC MATTER					ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMOS PER CM		MOISTURE TENSIONS			
8C1a		6A1a		6B1a		EST% SALT (BUREAU CUP)	6E1a		4B2			
1:5	1:10	ORGANIC CARBON	NITROGEN	C/N			CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
1:1		%	%				%	%	%	%		
5.8		1.78	.160	11.1							11.5	
5.9		1.64	.149	11.0							13.9	
6.1		1.11	.105	10.6							13.8	
6.3		0.54	.058	9.3							13.8	
6.5		0.22									14.4	
6.8		0.17									14.0	
6.8		0.10									14.1	
5A1a		EXTRACTABLE CATIONS					5B1a	Base Sat. %	5B1a	5A3a	4A3a	
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	BASE SAT. % NH ₄ Ac EXCH.	on Sum	Sum	Sum	Vol. Wt. g/cc		
	Ca	Mg	H	Na	K	5C1	Cations	< me/100 g >				
	← millequivalents per 100g. soil →											
20.8	11.0	3.6	11.0	-	0.8	74	58	15.4	26.4			
23.5	13.5	4.8	9.9	-	0.5	80	66	18.8	28.7			
24.0	14.2	5.9	9.1	0.1	0.5	86	69	20.7	29.3			
24.4	15.4	6.4	7.2	0.1	0.4	91	76	22.3	29.5	1.32		
24.9	16.3	6.9	5.6	0.1	0.5	96	81	23.8	29.4			
24.8	16.6	6.9	5.6	0.2	0.4	97	81	24.1	29.7			
24.6	17.0	7.0	4.4	0.3	0.4	100	85	24.7	29.1	1.36		
a. Few irregular light brown concr. (Fe-Mn?)												

Soil type: Marshall silty clay loam
 Soil No.: 857Nebr-89-9-(1-7)
 Location: 120 feet south and 135 feet west of northeast corner of southeast quarter of northeast quarter Sec. 25, T17N, R10E, Washington County, Nebraska.
 Physiography: Slightly rounded ridge top is dissected loess plain.
 Relief: 60 to 80 feet.
 Slope: 1 percent, smooth slightly convex.
 Parent material: Peorian loess.
 Drainage: Well drained.
 Permeability: Moderately slow.
 Salt or alkali: No carbonates to 120 inches.
 Land use: 1957, cats and seeding of alfalfa. Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

A1p 0 to 7 inches. Very dark brown (10YR 2/2 moist) to dark grayish brown (10YR 3.5/2 dry) silty clay loam; moderate subangular clods breaking to fine and very fine granules; friable, moist; slightly hard, dry; no effervescence; abrupt smooth boundary.
 6312

A8 7 to 11 inches. Very dark brown (10YR 2/2 moist) (10YR 3/3 moist crushed) to dark grayish brown (10YR 4.5/2 dry) silty clay loam; moderate fine granular; friable, moist; slightly hard, dry; abundant roots, few worm casts; no effervescence; clear smooth boundary.
 6313

B21 11 to 17 inches. Dark brown (10YR 3/3 moist) (10YR 4/3 dry) silty clay loam; weak medium prismatic breaking to fine and very fine subangular blocky; slightly firm, moist; hard, dry; abundant roots, few worm casts and openings, numerous fine and very fine pores; no effervescence; clear smooth boundary.
 6314

B22 17 to 30 inches. Dark brown (10YR 3/3.5 moist) (10YR 4/3 moist crushed) to brown (10YR 5.5/3 dry) silty clay loam; moderate medium prismatic breaking to moderate fine and very fine subangular blocky; slightly firm, moist; slightly hard, dry; abundant roots and very fine pores within aggregates; thin continuous coatings on large and small aggregates; fine gray and yellowish brown mottles in lower 2 inches of the horizon that are few, faint and fine; no effervescence; clear smooth boundary.
 6315

B23 30 to 40 inches. Dark brown (10YR 3.5/3 moist) to brown (10YR 5.5/3 dry) silty clay loam; weak coarse prismatic breaking to weak medium subangular blocky; slightly firm, moist; slightly hard, dry; numerous fine and very fine pores; abundant roots on faces of large aggregates; common faint fine yellowish brown mottles; common distinct medium strong brown mottles; no effervescence; clear smooth boundary.
 6316

B3 40 to 48 inches. Dark brown (10YR 3.5/3 moist) to brown (10YR 5.5/3 dry) silty clay loam; weak coarse prismatic breaking to weak medium and coarse subangular blocky; friable, moist; slightly hard, dry; numerous fine and very fine pores, few medium pores; common faint fine yellowish brown mottles; common distinct medium strong brown mottles; a few dark brown soft fine manganese concretions; few roots; no effervescence; gradual smooth boundary.
 6317

C 48 to 60 inches. Brown (10YR 4/3 moist) to pale brown (10YR 6/3 dry) silty clay loam; weak coarse prismatic, no smaller aggregates; thin coating on prisms; mottling as in horizon above with gray mottles common, faint and coarse; no effervescence.
 6318

Note: Substrata checked for effervescence to a depth of 120 inches; no effervescence. Horizons A1p, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell LOCATION Scotts Bluff County, Nebraska
silt loam

SOIL NOS. S53Nebr-79-4-(1-6) LAB. NOS. 1959-1964

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)								3A1		2A2 > 2	TEXTURAL CLASS								
		1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002											
0-6	Alp1	-	0.3	0.3	2.4	24.5	52.8	19.7	56.7	22.4	-	sil									
6-10	Alp2	-	0.2	0.3	2.3	24.8	52.0	20.4	55.9	22.7	-	sil									
10-16	B2	-	0.3	0.5	3.1	27.9	56.2	12.0	60.9	25.5	-	sil									
16-29	C1	-	1.1	1.1	4.2	28.9	54.8	9.9	64.1	22.4	-	sil									
29-41	C2	-	0.6	0.7	3.5	34.7	52.5	8.0	66.0	23.8	-	sil									
41-60	C3	-	-	1.0	3.5	32.5	56.7	6.3	68.8	23.0	-	sil									
pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6F1a	6F1a	MOISTURE TENSIONS												
8C1b SATURATED PASTE	8C1a	8C1a	6A1a		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM 8A1a	CoCO ₃ equivalent %	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	4B2									
	1:5	1:10	ORGANIC CARBON %	NITRO-GEN C/N					%	%	%	%									
7.8	8.3	8.5	1.00		a	0.9	1					14.1									
7.6	8.2	8.5	0.92			0.8	2					14.8									
7.7	8.3	8.5	0.44			0.8	6					15.0									
7.7	8.3	8.6	0.24			0.8	8	-				13.8									
7.7	8.3	8.7	0.13			0.8	7	-				12.7									
7.7	8.4	8.7	0.06			0.8	6	-				12.5									
5A1a	5B1a	CATIONS			5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A										
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE		EXCH. %	6F1a	6Q1a			MOISTURE AT SATURATION %											
	Ca	6Q2b Mg	6F2a Na	6Q2a K		Na	K														
← milliequivalents per 100g. soil →											← milliequivalents per liter →										
26.3		5.4		0.5	1.8	2	3.5	0.6				52.8									
26.4		5.2		0.5	1.9	2	3.5	0.6				53.4									
25.4		5.5		0.5	1.7	2	3.5	0.4				52.8									
24.7		4.8		0.6	1.6	2	4.1	0.4				49.5									
23.6		3.7		0.8	1.5	3	3.8	0.4				50.2									
23.8		3.1		0.6	1.5	2	3.2	0.2				51.0									
a. Less than 0.20%																					

Soil type: Mitchell silt loam
 Soil No.: S53Nebr-79-4-(1-6)
 Date sampled: October 1, 1953
 Location: Eight hundred feet east and 80 feet north of W1/4 corner Sec. 14, T22N R56W, Scotts Bluff County, Nebraska.
 Topographic position: Terrace.
 Relief: Slight, smooth slope less than 1 percent, north facing.
 Drainage: Well drained. Described by: John Elder.
 Ground water: 50 to 60 feet.
 Salt or alkali: No indication of either or of conditions which would result in accumulation of either at sample site.
 Root distribution: Normal throughout. No evidence of limiting horizons.
 Land use: Irrigated from ditch--beans 1953. Crop harvested prior to sampling, no yield available.

Mandan

Lab.No.	Horizon	
1959	Alp1	0-6 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam. Weak coarse subangular blocks breaking to weak very fine subangular blocks and weak fine and very fine granules, hard dry, friable moist, strong effervescence, abrupt smooth boundary.
1960	Alp2	6-10 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) silt loam. Weak fine subangular blocky to fine and very fine moderate granular (almost completely reworked by worms and insects) slightly hard dry, friable moist, strong effervescence, abrupt, smooth boundary.
1961	B2	10-16 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4.5/3 moist) silt loam. Very weak coarse blocky breaking to weak fine blocks and weak fine granules, slightly hard dry, friable moist, many worm casts and large root and insect openings, violent effervescence; clear, irregular boundary.
1962	C1	16-29 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) silt loam; massive but tends to break to very weak very fine granules or crumbs, soft dry, very friable moist, some small worm casts, a few very fine white lime specks and very fine brownish yellow mottlings, violent effervescence, diffuse wavy boundary.
1963	C2	29-41 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) silt loam; massive crushing to single grain, soft dry, very friable moist, few faint brownish yellow mottles along some root openings, violent effervescence; diffuse, wavy boundary.
1964	C3	41-60 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam; massive crushing to single grain, soft dry, very friable moist, violent effervescence; continues below 60 inches to undetermined depth.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell **LOCATION** Scotts Bluff County, Nebraska
silt loam

SOIL NOS. B53Nebr-79-2-(1-6) **LAB. NOS.** 1947-1952

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a					3A1					
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			2A2	
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	> 2	
0-7	A1p	-	0.4	0.6	3.3	26.5	52.1	17.1	60.1	20.9	-	sil
7-12	B2	-	0.3	1.0	5.5	23.8	45.1	24.3	50.6	22.0	-	1
12-17	B3	-	-	0.9	5.6	18.2	48.6	26.7	46.1	24.7	-	1
17-28	C1	-	-	0.5	3.2	11.6	59.4	25.3	36.0	37.2	-	sil
28-42	C2	-	-	1.1	6.2	21.6	52.5	18.6	53.7	24.6	-	sil
42-60	C3	-	-	3.2	17.2	24.9	37.1	17.6	57.8	15.5	-	1

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMOS PER CM 8A1a	6E1a CaCO ₃ equiv. cent	6F1a GYPSUM mg./100g. SOIL	MOISTURE TENSIONS		
	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6A1a NITROGEN %	6A1a C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
7.8	8.2	8.5	0.80			a	1.2	2				12.4
7.7	8.2	8.5	0.39				1.3	4				15.2
7.7	8.3	8.5	0.30				1.5	10				15.9
7.8	8.5	8.8	0.18				1.4	14	-			16.9
7.8	8.5	8.8	0.07				1.3	6	-			13.3
7.8	8.6	8.9	0.08				1.0	6	-			11.2

5A1a CATION EXCHANGE CAPACITY NH ₄ , OAc	5B1a CATIONS				5B1b	5D2 EXCH. No %	8A1 SATURATION EXTRACT SOLUBLE				8A MOISTURE AT SATURATION %
	EXTRACTABLE		EXCHANGEABLE				6P1a Na	6Q1a K			
	Ca	6O2b Mg	6P2a Na	6Q2a K				← milliequivalents per liter →			
24.0		4.9	1.1	2.0	5	4.9	0.5			49.2	
26.5		5.6	1.4	1.9	5	5.5	0.4			55.3	
25.5		5.3	1.5	1.6	6	6.1	0.4			55.8	
27.4		6.4	1.9	1.9	7	7.0	0.4			57.4	
23.0		5.6	1.6	2.4	7	6.7	0.6			46.2	
18.8		4.7	1.7	2.0	9	6.4	0.6			39.2	

a. Less than 0.20%

Soil type: Mitchell silt loam
 Soil No.: S53Nebr-79-2-(1-6)
 Location: Near center of Sec. 19, T22N R55W, Scotts Bluff County, Nebraska. North of Highway 86, 1/2 mile west of "turn off" to Scotts Bluff National Monument.
 Topographic position: Terrace.
 Relief: Slight, flat slope less than 1 percent, north facing.
 Drainage: Well drained. Described by: John Elder.
 Ground water: Water table about 46 feet.
 Salt or alkali: No indication of either at the sample site or nearby.
 Root distribution: Normal throughout. No evidence of limiting horizons. Roots most numerous between 7 and 17 inches.
 Land use: Irrigated from ditch--beans 1953. Harvested and ground plowed prior to sampling. Farmer reports moderate to high yields. Commercial fertilizer used on beets, not on other crops.

Mandan

Lab. No.	Horizon	Description
1947	Alp	0-7 inches. Light brownish gray (10YR 6.5/2 dry) to dark grayish brown (10YR 4.5/2 moist) silt loam. Coarse weak subangular blocks breaking to fine and very fine weak granules, slightly hard dry, friable moist, strong effervescence, grades abruptly and smoothly.
1948	B2	7-12 inches. Light brownish gray (10YR 6/2 dry) dark grayish brown (10YR 4/2 moist) silty clay loam. Coarse weak blocky breaking to medium and fine moderate blocks and fine weak granules. Slightly hard dry, friable moist, strong effervescence. The aggregates, when crushed, are slightly lighter than 10YR 4/2 moist, roots are abundant, many worm holes and insect openings are present, some are filled with lighter colored soil material. Gradual, wavy boundary.
1949	B3	12-17 inches. Pale brown (10YR 6.5/3 dry) to brown (10YR 5/3 moist) silty clay loam. Coarse weak subangular blocky breaking to medium and fine weak subangular blocks, friable moist, slightly hard dry. Many large worm holes filled with darker material from above, many fine pore and root openings, few roots, strong effervescence, clear irregular boundary.
1950	C1	17-28 inches. Very pale brown (10YR 7/3 dry) to brown (7.5YR 5/4 moist) silt loam. Coarse very weak subangular blocky breaking to fine and very fine very weak subangular blocks and fine weak granules. Soft dry, friable moist, violent effervescence, many root openings and worm openings, few roots, no segregated line. Diffuse, smooth boundary.
1951	C2	28-42 inches. Very pale brown (10YR 6.5/3 dry) to brown (10YR 5/3 moist) silt loam; coarse weak subangular blocky breaking to weak medium to fine subangular blocky and very fine weak granules; slightly hard, dry; friable, moist; strong effervescence; many fine white lime spots in pores and old root channels; many fine and very fine pores; diffuse smooth boundary.
1952	C3	42-60 inches. Pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam. Coarse very weak subangular blocky breaking to very fine weak subangular blocks and fine weak granules. Soft dry, friable moist, violent effervescence, few fine white lime spots and coatings in pore and root openings.

Note: Mixing of partially weathered Brule materials gives the 12-17 inch and 17-28 inch horizons a pinkish cast which is accented under moist condition. Horizon of 28-42 inches appeared to be an horizon of an old soil. The dry sample shows only slightly different color from the horizon above. If this is an old surface, development must have been slight.

SOIL TYPE Monona LOCATION Washington County, Nebraska
 silt loam

SOIL NOS. S57Nebr-89-3-(1-7) LAB. NOS. 6271-6277

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY					> 2 (19mm)
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002					
0-6	A1p	-	-	-	-	1.3	70.4	28.3	42.1	29.6	Tr.	sic1	
6-9	A12	-	-	-	-	1.3	69.9	28.8	41.0	30.2	-	sic1	
9-15	B21	-	-	-	-	1.2a	69.9	28.9	40.0	31.1	-	sic1	
15-27	B22	-	-	-	-	1.6a	70.3	28.1	41.1	30.8	-	sic1	
27-34	B23	-	-	-	0.1	1.9a	72.5	25.5	45.6	28.9	-	sil	
34-47	B3	-	-	-	-	1.8b	69.0	29.2	41.1	29.7	-	sic1	
47-62	C	-	-	-	0.1	2.4a	70.7	26.8	44.2	29.0	-	sil	

pH	ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC/10 ³ MILLIMHS PER CM	6E1a			MOISTURE TENSIONS				
	1:5	1:10	ORGANIC CARBON			6A1a	6B1a	C/N	CoCO ₃ equivalent	GYPSUM meq/100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
			%			%	%	%	%	%	%	%	%
6.0			1.83	.171	10.7							12.0	
6.0			1.64	.155	10.6							12.2	
6.4			1.13	.108	10.5							12.6	
6.7			0.55	.061	9.0							12.7	
6.7			0.33									12.5	
6.7			0.22									13.5	
7.0			0.15									12.8	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. % NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a Sum Bases	5A3a Sum Cations	Vol. Wt. g/cc
	6N2b	6O2b	6H1a	6P2a	6Q2a					
	Ca	Mg	H	Na	K					
	milliequivalents per 100g. soil									
						5C1	5C3	← me/100 g →		4A3a
21.7	12.2	3.7	10.0	0.1	0.7	77	62	16.7	26.7	
21.6	12.8	4.9	9.6	-	0.4	84	65	18.1	27.7	
21.9	13.9	5.8	7.7	0.1	0.2	91	72	20.0	27.7	
21.6	14.7	6.4	6.9	0.1	0.2	99	76	21.4	28.3	1.26
20.4	14.2	6.1	4.9	0.1	0.2	100	81	20.6	25.5	
23.3	16.3	6.9	4.4	0.1	0.3	100	84	23.6	28.0	
22.9	16.4	6.8	4.0	0.2	0.3	100	86	23.7	27.7	1.24

a. Common smooth brown concr. (Fe-Mn?)
 b. Common smooth brown concr. (Fe-Mn?) Also few CaCO₃ concr.

Soil type: Monona silt loam
 Soil No.: S57Nebr-89-3-(1-7)
 Location: .15 mile north and 100 feet west of southeast corner Sec. 18, T19N, R11E (on ridge top 75 feet west of light pole) Washington County, Nebraska.
 Physiography: Gently rolling ridges on loess uplands; 1 percent slope.
 Relief: 160 feet to 200 feet.
 Parent material: Peorian loess.
 Drainage: Excessive.
 Permeability: Moderate.
 Crop: Oats stubble.

Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

Alp
 6271 0 to 6 inches. Dark brown (10YR 3/3 dry) to very dark brown (10YR 2/2 moist) silt loam; weak fine and very fine granular; clear smooth lower boundary; very friable, moist; full of worm casts and contains numerous small pores or openings.

A12
 6272 6 to 9 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; weak very fine granular; full of worm casts and has many minute openings; very friable, moist; this layer is somewhat compressed like a plow layer; clear wavy boundary.

B21
 6273 9 to 15 inches. Brown (10YR 5/3 dry) to dark brown (10YR 4/3 moist) silty clay loam; weak coarse and medium prismatic to weak fine and very fine angular blocky; full of worm casts and contains many fine openings; crushed dry color 10YR 5/4; very friable, moist; clear wavy lower boundary.

B22
 6274 15 to 27 inches. Yellowish brown (10YR 5/4 dry) to dark brown (10YR 4/3 moist) silty clay loam; weak coarse prismatic breaking to weak fine and very fine subangular blocky; friable, moist; worm casts numerous and open channels and fine openings throughout; some dark stainings around worm casts and some very faint light grayish brown mottling; gradual wavy lower boundary.

B23
 6275 27 to 34 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) silty clay loam; friable, moist; many fine openings or pores and some worm or root channels filled with lighter-colored material. Light grayish brown mottlings are common but faint; gradual wavy lower boundary.

B3
 6276 34 to 47 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) heavy silt loam; very friable, moist; many small openings and channels throughout; yellowish brown mottlings are medium-sized and distinct throughout; weak coarse prismatic to weak fine and very fine subangular blocky; gradual wavy boundary.

C
 6277 47 to 62 inches. Pale brown (10YR 6/3 moist) silt loam; very friable, moist; very porous, containing many very fine openings and worm channels; iron stains throughout; gray to yellowish brown mottlings are common and distinct; massive structure.

Horizons Alp, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/9/58

SOIL TYPE Monona LOCATION Washington County, Nebraska
silt loam

SOIL NOS. S57Nebr-89-10-(1-7) LAB. NOS. 6319-6325

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1					2A2			
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	> 2	
		2:1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002		
0-6	Alp	-	-	-	-	1.3a	74.0	24.7	47.3	28.0	-	sil
6-9	Al2	-	-	-	-	1.2a	72.9	25.9	44.2	29.9	-	sil
9-13	B1	-	-	-	0.1	1.0a	74.1	24.8	45.0	30.2	-	sil
13-22	B21	-	-	-	-	1.1a	74.7	24.2	45.3	30.5	-	sil
22-34	B22	-	-	-	0.1a	1.7a	73.1	25.1	44.4	30.5	-	sil
34-48	B3	-	-	-	0.1a	2.1a	72.6	25.2	45.4	29.4	-	sil
48-60	C	-	-	-	0.2a	2.3a	72.2	25.3	47.7	26.9	-	sil

8C1a	pH	ORGANIC MATTER			ESTS SALT (BUREAU COP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	6E1a CaCO ₃ equivalent %	GYPSUM me./100g. SOIL	MOISTURE TENSIONS		
		6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N					4B2 1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
1:1	1:5	1:10									
5.6			1.73	.163	10.6						10.1
6.0			1.62	.147	11.0						11.3
6.3			1.33	.126	10.6						11.0
6.3			0.94	.094	10.0						10.5
6.5			0.46	.052	8.8						11.2
6.7			0.23								11.8
6.8			0.12								11.9

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. % NH ₄ Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	5B1a Sum Bases me./100 g	5A3a Sum Cations	4A3a Vol. Wt. g/cc
	6N2b Co	6O2b Mg	6H1a H	6P2a Na	6Q2a K					
19.5	10.3	3.6	11.0	-	0.7	75	57	14.6	25.6	
20.3	10.8	3.7	9.8	0.1	0.3	73	60	14.9	24.7	
19.9	11.7	4.2	8.2	0.1	0.3	82	66	16.3	24.5	
19.6	12.0	4.6	7.5	0.1	0.3	87	69	17.0	24.5	
21.5	13.5	5.5	5.5	0.1	0.3	90	78	19.4	24.9	1.26
20.8	14.4	5.6	4.8	0.2	0.3	98	81	20.5	25.3	
21.8	15.0	5.7	4.3	0.2	0.4	98	83	21.3	25.6	1.24

a. Few irregular light brown concr. (Fe-Mn?)

Soil type: Monona silt loam
 Soil No.: S57Nebr-89-10-(1-7)
 Location: .2 mile west and 1200 feet south of northeast corner of northwest quarter Sec. 18; T17N, R12E, Washington County, Nebraska. Approximately 400 feet east and 100 feet north of center of northwest quarter on ridge top; $\frac{1}{2}$ miles west and $\frac{1}{2}$ mile south of Ft. Calhoun, Nebraska.
 Physiography: Rounded ridge top in strongly rolling loess country.
 Relief: 200 feet.
 Slope: 1 percent on top of rounded ridge top.
 Parent material: Peorian loess.
 Drainage: Excessive.
 Permeability: Moderate.
 Salt or alkali: None.
 Crop: Oats stubble.

Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

Alp
 6319 0 to 6 inches. Dark brown (10YR 4/3 moist) silt loam; weak very fine crumb; slightly hard, dry; very friable, moist; abrupt smooth lower boundary; many fine roots in this material.

A12
 6320 6 to 9 inches. Very dark grayish brown (10YR 3/2 moist) silt loam; slightly hard, dry; very friable, moist; moderate fine and very fine granular structure; full of worm casts and many fine openings or small channels; granules have thin shiny dark brown coating, crushed color is 10YR 4/2.

B1
 6321 9 to 13 inches. Dark grayish brown (10YR 4.5/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy silt loam; slightly hard, dry; very friable, moist; moderate fine and very fine subangular blocky; dark shiny coatings on faces of blocks; worm casts numerous and contain many fine pores or openings or channels; clear wavy lower boundary.

B21
 6322 13 to 22 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3.5/3 moist) heavy silt loam; moderate fine and very fine subangular blocky; hard, dry; very friable, moist; worm casts throughout this layer; many fine openings and channels; dark coating on faces of blocks; gradual wavy lower boundary.

B22
 6323 22 to 34 inches. Yellowish brown (10YR 5/4 dry) to dark yellowish brown (10YR 4/4 moist) light silty clay loam; weak coarse prismatic breaking to weak fine and very fine subangular blocky; worm casts and many fine openings or channels throughout; gradual wavy lower boundary.

B3
 6324 34 to 48 inches. Light yellowish brown (10YR 6/4 dry) silt loam; moderate coarse prismatic breaking to a medium and fine angular fragment or clod; some worm casts and many fine openings and channels; gray and yellowish brown mottling are common and distinct; few dark iron or manganese concretions throughout; gradual wavy lower boundary.

C
 6325 48 to 60+ inches. Light yellowish brown (10YR 6/4 dry) silt loam; weak coarse prismatic structure; shiny brown surfaces on faces of prisms; entire matrix mottled with gray and yellowish brown so that basic color is difficult to determine; mottling is distinct and medium-sized; matrix full of fine pores or openings; few fine manganese concretions throughout; some dark brown concretions of iron.

Note: The above hole was probed to 120 inches and no lime was encountered; mottled silt loam yellowish brown loess all the way to 120 inches. Horizons Alp, B22 and C sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebraska 5/24/57

SOIL TYPE Moody LOCATION Dixon County, Nebraska
 silty clay loam (deep, eroded)

SOIL NOS. S-55-Nebr-26-1-(1-7) LAB. NOS. 2855-2861

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2	
0-7	Alp	0.3	0.2	0.1	0.3	6.9	61.5	30.7	44.8	23.8	-	sic1
7-13	B1	-	-	0.1	0.3	5.2	60.9	33.5	40.3	26.0	-	sic1
13-21	B21	-	-	-	0.3	5.1	63.1	31.5	40.1	28.3	-	sic1
21-30	B22	0.1	0.1	0.1	0.5	8.4	63.1	27.7	48.7	23.1	-	sic1
30-46	B23	-	-	-	0.2	7.8	65.9	26.1	53.6	20.3	-	sil
46-55	B3	-	-	-	0.2	8.1	67.4	24.3	53.8	21.9	-	sil
55-60	Cca	0.2	0.2	0.1	0.2	8.3	67.4	23.6	53.2	22.7	-	sil

pH 8C1a		ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @25°C.	6E1a			MOISTURE TENSIONS	
1:1	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %			C/N	CaCO ₃ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %
7.8	8.0	8.3	1.52	.150	10.1						14.5
7.8	8.1	8.2	0.77	.074	10.4						15.5
7.4	7.7	7.6	0.51	.059	8.6						14.8
7.1	7.4	7.5	0.35	.044	8.0						13.5
6.9	7.4	7.4	0.27								13.1
6.9	7.4	7.4	0.22								12.8
7.8	8.4	8.5	0.21								12.7

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	4A3a Vol. Wt. g/cc	MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K			
27.3		4.2		0.1	0.5			
28.7	24.9	6.2		0.1	0.3		1.34	
27.3	22.4	6.6		0.1	0.3			
25.6	19.8	6.0		0.1	0.4		1.35	
23.5	18.8	5.0		0.2	0.4			
23.0	19.1	4.6		0.2	0.4			
21.0		5.0		0.2	0.4		1.24	

Soil type: Moody silty clay loam, deep, eroded

Soil No.: 855Webr-26-1-(1-7)

Location: .15 mile north and 75 feet east of west quarter corner Sec. 14, T27N, R4E, Dixon County, Nebraska.

Physiography: Gently rolling to rolling loess plain; on 800-foot long west-southwest facing 6 to 8 percent slope, about 300 feet upslope from drain.

Use: Cultivated, corn.

Collected by: D. W. DeMoude, H. L. Kollmorgen, B. H. Williams, J. A. Elder, R. D. Greenawalt, T. F. Clapper and J. S. Allen, July 1955.

Described by: B. H. Williams.

Horizon and

Mandan

Lab. Number

- Alp 2855 0 to 7 inches. Dark grayish brown to very dark grayish brown (10YR 4/2 dry to 3/2 moist) silty clay loam; weak fine and very fine crumb structure; soft, dry; very friable, moist; calcareous, weak effervescence; a few fine lime concretions, limy material, washed down from eroding higher slope; abrupt lower boundary.
- B1 2856 7 to 13 inches. Dark grayish brown to very dark grayish brown (10YR 4/2.5 dry to 3/2.5 moist) silty clay loam; weak coarse prismatic and moderate medium fine and very fine blocky structure; hard, dry; friable, moist; noncalcareous; clear smooth lower boundary.
- B21 2857 13 to 21 inches. Brown to dark brown (10YR 5.5/3 dry to 3.5/3 moist) silty clay loam; moderate coarse prismatic and moderate medium and coarse blocky structure; weak to moderate and nearly continuous glaze on ped surfaces; hard, dry; firm, moist; noncalcareous; clear smooth lower boundary.
- B22 2858 21 to 30 inches. Pale brown to brown (10YR 6/3 dry to 4/3 moist) silty clay loam; few faint fine gray and yellowish brown mottles; moderate medium prismatic and moderate medium and coarse blocky structure; glaze on peds like in horizon above; hard, dry; firm, moist; plant roots common to many in this horizon and the ones above; noncalcareous; gradual smooth lower boundary.
- B23 2859 30 to 46 inches. Pale brown to brown (10YR 6/3 dry to 5/3 moist) silty clay loam, near silt loam boundary; common faint fine gray and yellowish brown mottles and fine streaks and fine dark brown to black soft iron-manganese concretions; plant roots few, old root channels and pores common; weak to moderate coarse prismatic structure; weak discontinuous glaze on ped surfaces; hard, dry; firm, moist; noncalcareous; gradual smooth lower boundary.
- B3 2860 46 to 55 inches. Very pale brown to brown (10YR 7/3 dry to 5/3 moist) silt loam; common faint fine gray, strong brown and yellowish brown mottles; weak coarse prismatic structure; slightly hard, dry; friable, moist; common prominent fine dark brown to black iron-manganese streaks and fine soft concretions; no living plant roots observed; old root channels common; noncalcareous; abrupt smooth lower boundary.
- Cca 2861 55 to 60 inches. Pale yellow and yellow to olive yellow and light olive brown (2.5Y 7/4 and 7/6 dry to 6/6 and 5/6 moist) silt loam; common distinct medium gray and yellowish brown mottles; massive; slightly hard, dry; friable, moist; a few distinct fine very dark brown iron-manganese streaks and soft concretions; calcareous; violent effervescence; fine streaks and seams of lime and a few hard lime concretions up to 1/2 inch in diameter.

Horizons Alp, B22 and Cca sampled for Bureau of Public Roads.

SOIL TYPE Mucky silty clay loam LOCATION Dixon County, Nebraska

SOIL NOS. S59Nebr-26-1-(1-8) LAB. NOS. 11370-11377

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY		> 2		
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	< 0.002	< 19mm		
0-7	Alp	0.1	0.2	0.7	2.2	4.2	62.8	29.8	45.5	22.6	-	sicl
7-10	Al2	0.1	0.1	0.3	0.8	2.6	63.4	32.7	38.3	28.1	-	sicl
10-13	A3	0.1	<0.1	0.1	0.4	1.8	63.9	33.7	35.9	30.0	-	sicl
13-19	B1	<0.1	<0.1	0.1a	0.3b	1.4b	64.7	33.5	33.4	32.9	-	sicl
19-31	B21	<0.1	<0.1	<0.1	0.1b	2.2b	62.5	35.2	36.7	28.1	-	sicl
31-39	B22	<0.1	<0.1	<0.1	0.3b	3.7b	63.4	32.6	41.8	25.5	-	sicl
39-46	B3	<0.1	<0.1	0.2a	0.6b	7.2b	60.2	31.8	45.5	22.3	Tr.	sicl
46-60	C	<0.1	0.1a	0.2a	0.8b	8.3b	65.2	25.4	53.3	20.7	Tr.	sil

pH		ORGANIC MATTER			Free Iron	ELECTRICAL CONDUCTIVITY	MOISTURE TENSIONS				
8C1a		6A1a	6B1a		Fe ₂ O ₃	EC · 10 ³	6E1a		4B2		
	1:5	ORGANIC CARBON	NITROGEN	C/N		MILLIMHOS PER CM @ 25°C	CoCO ₃ equiv- alent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
		%	%		6C1a		%		%	%	%
5.7		2.14	0.193	11.1	1.4						12.8
5.8		1.66	0.162	10.2	1.5						14.1
6.5		1.38	0.137	10.1	1.6						13.8
6.6		1.02	0.106	9.6	1.6		Δ				13.9
6.8		0.52	0.061	8	1.7		Δ				14.9
7.2		0.35			1.6		Δ				14.6
7.6		0.26			1.7		Δ				14.4
7.9		0.17			1.6		1				12.4

5A1a	EXTRACTABLE CATIONS					5B1a	BASE SAT. %	Base Sat. %	Sum Ext. Bases	Sum Ext. Cations	Ca/Mg	MOISTURE AT SATURATION
CATION EXCHANGE CAPACITY MEQ./Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	NH ₄ Ac EXCH.	on Sum Cations					%
	Ca	Mg	H	Na	K							
	milliequivalents per 100g. soil					5C1	5C3	5B1a	5A3a	8D3		
22.1	14.1	4.6	8.8	<0.1	0.7	88	69	19.4	28.2	3.1		
23.2	16.5	5.8	7.0	<0.1	0.4	98	76	22.7	29.7	2.8		
23.3	17.4	6.1	5.5	0.1	0.4	103	81	24.0	29.5	2.8		
23.4	17.7	6.6	6.5	0.1	0.4	106	79	24.8	31.3	2.7		
24.5	18.8	7.5	4.8	0.1	0.4	109	85	26.8	31.6	2.5		
25.0	19.1	7.3	3.3	0.2	0.4	108	89	27.0	30.3	2.6		
24.3	22.8	7.4	2.0	0.2	0.4		94	30.8	32.8	3.1		
21.3		7.3	0.8	0.3	0.4							

a. Common (Fe-Mn?) concn.
b. Few (Fe-Mn?) concn.

Soil type: Moody silty clay loam

135

Soil No.: S59Nebr-26-1-(1-8)

Location: 750 feet west and 250 feet south of Center Sec. 22, T28N, R4E,
Dixon County, Nebraska. Northeast Nebraska Experiment Station.

Physiography: Rolling loess hills.

Relief: 50 to 100 feet.

Slope: 6 percent west - convex.

Parent material: Peorian loess.

Drainage: Well.

Permeability: Moderately slow.

Land Use: Cultivated.

Described by and date: J. V. Drew and J. A. Elder, June 25, 1959.

Lincoln

Lab. No. Horizon Depth

- | Lab. No. | Horizon | Depth | Description |
|----------|-----------------|--------|--|
| 11370 | A _{1p} | 0-7" | Very dark brown (10YR 2/2 moist) silty clay loam. Weak very fine granular structure. Friable moist, slightly hard dry. Abundant roots. No effervescence. Abrupt smooth boundary. |
| 11371 | A ₁₂ | 7-10" | Very dark brown (10YR 2/2 moist) silty clay loam. Moderate fine granular structure. Friable moist, slightly hard dry. Abundant roots. No effervescence. Clear smooth boundary. |
| 11372 | A ₃ | 10-13" | Very dark grayish brown (10YR 3/2 moist) (10YR 4/2.5 moist crushed) silty clay loam. Moderate fine subangular blocky breaking to fine granular structure. Friable moist, slightly hard dry. No effervescence. Clear smooth boundary. |
| 11373 | B ₁ | 13-19" | Dark brown (10YR 3/3 moist) (10YR 4/3 moist crushed) silty clay loam. Weak fine prismatic breaking to moderate fine subangular blocky structure. Friable moist, hard dry. No effervescence. Clear smooth boundary. |
| 11374 | B ₂₁ | 19-31" | Dark brown (10YR 4/3 moist) (10YR 4/3 moist crushed) silty clay loam. Weak medium prismatic breaking to moderate fine angular blocky structure. Firm moist, hard dry. A few thin discontinuous clay films on aggregates. No effervescence. Gradual smooth boundary. |
| 11375 | B ₂₂ | 31-39" | Dark brown (10YR 4/3 moist) silty clay loam. Weak medium prismatic breaking to moderate medium and fine subangular blocky structure. Firm moist, hard dry. Thin discontinuous clay films on larger aggregates. No effervescence. Many medium distinct gray mottles and common fine distinct strong brown iron stains. Clear smooth boundary. |
| 11376 | B ₃ | 39-46" | Dark brown (10YR 4/3 moist) silty clay loam. Weak medium and fine subangular blocky structure. Friable moist, slightly hard dry. Many medium distinct gray mottles. Many fine distinct strong brown and dark brown iron stains. Slight effervescence in lower inch. Abrupt wavy boundary. |
| 11377 | C | 46-60" | Dark grayish brown (10YR 4/2.5 moist)* silty clay loam. Very friable moist, soft dry. A few soft and an occasional large 1/4-3/4-inch CaCO ₃ concretions. Lime in pores and openings. Strong effervescence. Worm working common. Coats are larger and harder than in horizons above. Mottling same as horizon above. |

* Tending toward 2.5Y hue.

SOIL SURVEY LABORATORY

Mandan, N. Dak. ^{a/}

9/20/55

SOIL TYPE Moody

LOCATION Wayne County, Nebraska

silty clay loam, eroded

SOIL NOS. 354Nebr-90-2-(1-7)

LAB. NOS. 2171-2177

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		3A1										
		1B1b	VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			
	2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.075	0.075-0.002	> 2		
0-7 1/2	Ap	0.1	0.2	0.1	0.4	4.2	58.2	36.8	42.4	20.3	-	sic1
7 1/2-18	B21	-	-	-	0.2	5.6	58.2	36.0	42.1	21.7	-	sic1
18-26	B22	-	-	-	0.2	4.5	62.8	32.5	43.3	24.1	-	sic1
26-33	B23	-	-	0.1	0.3	5.1	64.6	29.9	45.0	21.0	-	sic1
33-44	B3	-	-	0.2	0.5	6.4	56.3	36.6	48.0	15.0	-	sic1
44-47	C	-	-	-	0.3	5.2	66.2	28.3	49.9	21.7	-	sic1
47-60	Cca	0.1	0.1	0.1	0.5	6.9	67.8	24.5	50.7	24.4	-	sil

8C1b SATURATED PASTE	pH		ORGANIC MATTER			EST. SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC-10 ³ MILLIMHOS PER CM	6E1a		MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	CoCO ₃ equiv- alent %			GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.	
	1:8	1:10	ORGANIC CARBON %	NITRO- GEN %								C/N
6.0	6.4	6.6	2.32	.214	10.8	-	-	-	-	16.0		
6.0	6.7	7.0	1.14	.116	9.8	-	-	-	-	15.5		
6.4	7.2	7.3	0.47	.058	8.1	-	-	-	-	14.5		
6.6	7.3	7.4	0.27			-	-	-	-	13.6		
6.7	7.5	7.7	0.20			-	-	-	-	13.1		
6.9	7.3	7.8	0.19			-	-	-	-	13.4		
7.7	8.5	8.8	0.16			5	-	-	-	12.3		

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATU- RATION %
	6P2a								
	6K2b Ca	6Q2b Mg	H	No	K				
29.2	17.6	6.5		0.1	1.6	88	25.3	2.7	
28.8	18.6	7.7		0.1	0.4	93	26.0	2.4	
26.5	18.0	7.5		0.2	0.4	98	26.1	2.4	
25.0	17.4	7.3		0.2	0.4	100	25.3	2.4	
24.0	17.1	7.0		0.3	0.4	100	24.8	2.4	
24.1	17.3	6.9		0.3	0.4	100	24.9	2.5	
22.1				0.3	0.5				

a/ Particle size analyses by Beltsville Laboratory

Soil type: Moody silty clay loam, eroded
 Soil No.: S54Nebr-90-2-(1-7)
 Location: 120 feet north of south quarter corner Sec. 35, T26N, R3E, Wayne County, Nebraska.
 Topography: Slightly convex ridge top with 4 percent northward dip to the ridge; rolling landscape with total relief of 80 to 100 feet.
 Use. Cultivated, corn 1954.
 Described by: B. H. Williams

Mandan

Lab.

No. Horizon Depth

- 2171 A_p 0-7½" Dark grayish brown (10YR 4/1.5, dry) to very dark brown (10YR 2.5/2, moist) silty clay loam; weak fine granular structure; slightly hard, dry; friable, moist; abrupt smooth lower boundary, except slight A₃ or B₁ tonguing 2 or 3 inches into the next (B₂₁) horizon.
- 2172 B₂₁ 7½-18" Yellowish brown (10YR 5/4, dry) to dark brown (10YR 4/3, moist) silty clay loam, with slight tonguing of darker material and numerous worm casts from the horizon above; compound weak coarse prismatic, weak medium and coarse blocky and moderate medium granular in the darker crack-filling material; hard, dry; friable, moist; gradual smooth lower boundary.
- 2173 B₂₂ 18-26" Yellowish brown (10YR 5/4, dry) to dark brown (10YR 3.5/3, moist) silty clay loam; compound weak coarse prismatic and moderate coarse blocky structure; hard, dry; friable, moist; slight glaze on blocky peds and some dark organic staining along vertical cleavage planes; clear smooth lower boundary.
- 2174 B₂₃ 26-33" Yellowish brown (10YR 5.5/4, dry) to dark yellowish brown (10YR 4.5/3, moist) silty clay loam; a few faint fine gray mottles in lower 2 or 3 inches; compound weak coarse prismatic and moderate coarse blocky structure; hard, dry; friable, moist; weak glaze most structure planes; a few fine thread-like pores and channels; clear smooth lower boundary.
- 2175 B₃ 33-44" Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 5/4, moist) silty clay loam; few faint fine gray and dark yellowish brown mottles and very dark brown iron-manganese stains; compound weak coarse prismatic and weak coarse blocky structure; soft, dry; friable, moist; numerous thread-like pores and tubes; clear smooth lower boundary.
- 2176 C 44-47" Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 5/4, moist) heavy silt loam; few faint fine gray and strong brown mottles; massive; soft, dry; friable, moist; numerous fine thread-like pores; clear smooth lower boundary.
- 2177 C_{ca} 47-60" Light yellowish brown (10YR 6/4, dry) to yellowish brown (10YR 5/4, moist) silt loam; common faint fine and coarse gray and strong brown mottles and very dark brown iron-manganese stains; massive; soft, dry; friable, moist; numerous fine and medium pores and thread-like channels; gray and brown staining, somewhat concentric, around the channels; calcareous, with effervescence only on lime spots and concretions in the upper part; strong effervescence throughout in the lower part.

SOIL TYPE *Morrill LOCATION Saunders County, Nebraska
clay loam

SOIL NOS. 558 Nebr-78-2-(1-8) LAB. NOS. 8422-8429

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a										
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1		2A2 > 2 (19mm)	
0-5	Alp	1.7	5.0	4.3	10.3	8.0	48.5	22.2	48.3	13.5	Tr.	1
5-9	Al2	0.7	5.0	4.1	8.8	7.7	47.6	26.1	44.4	15.2	Tr.	1
9-12	A3	3.1	6.9	3.9	3.9	11.2	41.6	29.4	38.5	14.4	Tr.	cl
12-19	B21	2.8	8.1	3.9	4.0	12.8	36.7	31.7	36.7	12.9	Tr.	cl
19-28	B22	5.5	12.1	4.9	5.2	16.2	29.6	26.5	36.2	9.7	Tr.	1
28-40	B23	8.4	13.8	5.6	7.0	19.2	24.8	21.2	36.2	7.9	Tr.	sc1
40-51	C1	8.5	13.8	6.8	7.1	24.9	22.1	16.8	41.4	5.7	Tr.	sl
51-60	C2	8.0	23.7	10.3	9.7	24.1	13.1	11.1	33.8	3.5	3	cos1

8C1a	pH	ORGANIC MATTER			ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHDS PER CM 8A1a	6E1a CaCO ₃ equiv-alemt %	MOISTURE TENSIONS			
		6A1a ORGANIC CARBON	6B1a NITRO-GEN	C/N			1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.	
		%	%				%	%	%	
1:1	1:5	1:10								
5.4			1.32	0.124	10.6		0.4			8.5
5.9			1.38	0.130	10.6		0.4			10.5
6.2			1.11	0.104	10.7		0.4			12.2
6.2			0.59	0.061	10		0.3			12.5
6.3			0.34	0.037	9		0.4			11.0
6.5			0.17				0.4			9.1
6.6			0.08				0.4	<		7.4
7.0			0.03				0.4	<		4.6

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5B1a BASE SAT. % NH ₄ Ac EXCH.	Base Sat. % on Sum Cations 5C3	5B1a Sum Bases	5A3a Sum Cat-ions	8D3 Ca/Mg	8A MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K						
	milliequivalents per 100g. soil										
14.2	7.8	3.2	7.3	<0.1	0.6	82	61	11.6	18.9	2.4	43.6
16.6	10.4	4.2	6.1	<0.1	0.4	90	71	15.0	21.1	2.5	52.8
18.7	11.6	5.5	5.3	0.1	0.4	94	77	17.6	22.9	2.1	53.8
18.6	11.3	6.0	4.9	0.1	0.4	96	78	17.8	22.7	1.9	58.0
15.9	9.7	5.7	4.1	0.1	0.3	99	79	15.8	19.9	1.7	56.2
13.4	8.3	4.7	2.8	0.1	0.2	99	83	13.3	16.1	1.8	48.7
11.8	7.4	4.2	1.6	0.1	0.2	101	88	11.9	13.5	1.8	42.8
8.2	5.1	2.8	2.0	0.1	0.2	100	80	8.2	10.2	1.8	27.8

Soil type: Morrill clay loam
 Soil No.: 858Nebr-78-2-(1-8)
 Location: 160 feet east and 40 feet north of south quarter corner Sec. 15, T13N, R6E; approximately 2 miles north and 4 miles west of Ceresco, Saunders County, Nebraska.
 Physiography: Dissected till plain (lower section Kansan till).
 Relief: 40 to 50 feet.
 Slope: 7 percent north facing slope.
 Parent material: Mixed Kansan sands and till remnants.
 Erosion: Moderate.
 Drainage: Well to excessive.
 Permeability: Moderately slow.
 Land use: Corn 1958.

Described by: W. E. McKinzie and J. A. Elder.

Horizon and
 Lincoln
 Lab. Number

A1p 0 to 5 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) light clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
 8422

A12 5 to 9 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) silty clay loam; weak coarse subangular blocky to weak fine granular; friable, moist; no effervescence; worm activity transported in material from lower horizons; clear smooth boundary.
 8423

A3 9 to 12 inches. Dark reddish brown (5YR 3/2 moist) to dark brown (7.5YR 4/2 dry) silty clay loam; weak coarse subangular blocky to moderate fine and medium granular; friable, moist; no effervescence; clear wavy boundary.
 8424

B21 12 to 19 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) silty clay loam; weak coarse subangular blocky to weak fine and medium subangular blocky; friable, moist; no effervescence; gradual smooth boundary.
 8425

B22 19 to 28 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) clay loam; weak coarse prismatic to weak fine and medium blocky; firm, moist; no effervescence; gradual smooth boundary.
 8426

B23 28 to 40 inches. Yellowish red (5YR 4/6 moist) to yellowish red (5YR 5/6 dry), crushed color (5YR 5/6 moist) clay loam; weak coarse prismatic to weak medium and fine subangular blocky; firm, moist; no effervescence; gradual smooth boundary.
 8427

C1 40 to 51 inches. Reddish yellow (7.5YR 6/6 moist) to reddish yellow (7.5YR 7/6 dry), crushed color (7.5YR 5/4 moist) light clay loam; weak coarse prismatic; friable, moist; no effervescence; clear smooth boundary.
 8428

C2 51 to 60 inches. Strong brown (7.5YR 5/6 moist) to reddish yellow (7.5YR 6/6 dry) loamy sand; massive; very friable, moist; no effervescence; large rodent burrows filled with material from horizon above.
 8429

Note: Few gravels scattered throughout profile; aftenian silts present at 90 inches.

SOIL TYPE Morrill clay loam LOCATION Saunders County, Nebraska

SOIL NOS. S58Nebr-78-4-(1-8) LAB. NOS. 8441-8448

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			> 2 (< 9mm)		
2-1	1.0-5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002					
0-7	A1p	0.2	3.8	6.8	19.0	10.2	39.1	20.9	48.5	11.6	-	1	
7-9	A12	0.6	4.7	6.8	11.6	14.7	38.4	23.2	45.1	11.9	-	1	
9-12	A3	0.6	5.1	6.3	12.5	7.3	39.0	29.2	39.7	13.1	-	cl	
12-22	B21	0.6	6.1	7.1	9.8	5.7	40.4	30.3	35.9	14.4	-	cl	
22-34	B22	1.2	7.8	9.4	8.8	8.6	37.5	26.7	37.0	10.6	Fr.	1	
34-42	B23	0.9	9.0	13.0	17.2	6.6	30.7	22.6	34.4	9.6	Fr.	1	
42-54	C1	2.2	13.9	16.7	13.6	13.0	21.4	19.2	29.4	6.9	Fr.	sl	
54-60	C2	0.7	18.0	22.2	16.2	6.2	21.3	15.4	26.3	7.1	-	sl	

pH	ORGANIC MATTER			ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	6E1a CaCO ₃ equiv-alent %	MOISTURE TENSIONS		
	8C1a	6A1a ORGANIC CARBON	6B1a NITRO-GEN			4B2 15 ATMOS.		
	1:5	1:10	C/N			1/10 ATMOS.	1/3 ATMOS.	
1:1		%	%					
6.1		1.25	0.127	9.8	0.4			8.5
6.1		1.26	0.115	11.0	0.4			9.5
5.9		1.04	0.101	10.3	0.4			11.8
5.9		0.68	0.072	9	0.4			12.6
6.1		0.34	0.041	8	0.4			10.8
6.4		0.21			0.4			9.7
6.4		0.12			0.5			7.9
6.5		0.08			0.4	<1		6.7

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac'	EXTRACTABLE CATIONS 5B1a					BASE SAT. % NH ₄ Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	5B1a Sum Bases	5A3a Sum Cations	8D3 Ca/Mg	8A MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6H1a H	6P2a No	6Q2a K						
	milliequivalents per 100g. soil										
14.5	9.4	2.9	5.6	<0.1	0.6	89	70	12.9	18.5	3.2	43.9
15.5	9.9	3.4	4.8	<0.1	0.6	90	74	13.9	18.7	2.9	45.1
19.1	11.5	4.3	6.1	<0.1	0.5	85	73	16.3	22.4	2.7	55.5
19.5	12.1	5.2	4.9	<0.1	0.4	91	78	17.7	22.6	2.3	56.8
16.9	10.6	4.9	3.3	0.1	0.3	94	83	15.9	19.2	2.2	52.9
15.3	9.8	4.2	2.4	0.1	0.3	94	86	14.4	16.8	2.3	49.2
12.5	8.3	3.6	1.6	0.1	0.2	98	88	12.2	13.8	2.3	45.5
10.2	6.8	2.7	1.2	0.1	0.2	96	89	9.8	11.0	2.5	43.4

Soil type: Morrill clay loam

Soil No.: 858Meb-78-4-(1-8)

Location: 300 feet west and 150 feet south of north quarter corner Sec. 26, T13N, R5E. (Straight west of south end of long shed in farmstead which is located approximately .25 mile east). Approximately 1/2 mile south and 1 mile east of Valparaiso, Saunders County, Nebraska.

Physiography: Dissected till plain (Lower section of Kansan till).

Relief: 40 to 50 feet.

Slope: 9 percent east facing slope.

Parent material: Mixed Kansan sands and till remnants.

Erosion: Moderate.

Drainage: Well to excessive.

Permeability: Moderately slow.

Land use: Corn 1958.

Described by: W. E. McKinzie and J. A. Elder.

Horizon and

Lincoln

Lab. Number

- A1p
8441 0 to 7 inches. Very dark brown (10YR 2/2 moist) to dark brown (10YR 3/3 dry) light clay loam; weak fine granular; very friable, moist; no effervescence; abrupt smooth boundary.
- A12
8442 7 to 9 inches. Very dark brown (10YR 2/2 moist) to dark grayish brown (10YR 4/2 dry) light silty clay loam; weak coarse subangular blocky to weak fine and medium granular; friable, moist; no effervescence; rodents have brought up material from lower horizons; clear smooth boundary.
- A3
8443 9 to 12 inches. Dark brown (7.5YR 3/2 moist) to dark brown (7.5YR 4/2 dry) silty clay loam; weak coarse subangular blocky to weak fine and medium granular; friable, moist; no effervescence; clear smooth boundary.
- B21
8444 12 to 22 inches. Dark reddish brown (5YR 3/4 moist) (5YR 4/4 moist crushed) to reddish brown (5YR 5/4 dry) silty clay loam; moderate coarse prismatic to moderate fine and medium subangular blocky; firm, moist; no effervescence; gradual smooth boundary.
- B22
8445 22 to 34 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) clay loam; weak coarse prismatic to moderate fine and medium subangular blocky; firm, moist; no effervescence; thin continuous clay skins; gradual smooth boundary.
- B23
8446 34 to 42 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) clay loam; weak coarse prismatic to weak medium subangular blocky; firm, moist; no effervescence; thin patchy clay skins on faces of aggregates; gradual smooth boundary.
- C1
8447 42 to 54 inches. Reddish brown (5YR 4/4 moist) to reddish brown (5YR 5/4 dry) silty clay loam; weak coarse subangular blocky; firm, moist; no effervescence; gradual smooth boundary.
- C2
8448 54 to 60 inches. Dark brown (7.5YR 4/4 moist) to brown (7.5YR 5/4 dry) light clay loam; weak coarse subangular blocky; friable, moist; no effervescence.

SOIL SURVEY LABORATORY

Lincoln, Nebr.

December 1959

SOIL TYPE

Nora
silty clay loam

LOCATION

Dixon County, Nebraska

SOIL NOS.

S59Nebr-26-2-(1-8)

LAB. NOS.

11378-11385

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	< 0.002		
0-5	Alp	0.2	0.2	0.9	2.8	6.7	59.5	29.7	48.9	18.7	-	sic1	
5-9	Al2	<0.1	0.1	0.2	0.8	5.7	60.2	33.0	46.5	19.8	-	sic1	
9-13	A3	<0.1	<0.1	0.1	0.3	6.2	62.0	31.4	47.5	20.9	-	sic1	
13-17	B21	<0.1	<0.1	<0.1	0.3	8.1	62.5	29.1	50.9	19.9	-	sic1	
17-22	B22	<0.1	<0.1	<0.1	0.5a	7.1a	64.9	27.5	54.4	18.0	-	sic1/sil	
22-36	B3ca	0.4b	0.1b	0.1b	0.7b	7.6b	68.6	22.5	55.9	20.8	Tr.	sil	
36-50	C1	<0.1	<0.1	0.1b	0.8b	9.1b	69.0	21.0	59.3	19.4	Tr.	sil	
50-60	C2	0.1b	0.1b	0.1b	1.0b	9.4b	69.0	20.3	60.9	18.3	Tr.	sil	

8C1a	PH		ORGANIC MATTER			Free Iron Fe ₂ O ₃ % 6C1a	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 25°C	6E1a CaCO ₃ equiv- alent %	MOISTURE TENSIONS			4B2 15 ATMOS. %
	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N				1/10 ATMOS. %	1/3 ATMOS. %		
	6.1			1.97	0.174				11.3	1.3		
6.5			1.52	0.143	10.6	1.5				14.7		
6.8			0.98	0.098	10	1.5				13.8		
7.0			0.67	0.073	9	1.5				12.9		
7.0			0.55	0.064	8	1.5				12.6		
8.0			0.30	0.040	8	1.3				10.8		
8.2			0.14			1.3				10.3		
8.2			0.12			1.4				9.9		

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. % NH ₄ Ac EXCH. 5C1	Base Sat. % on Sum Cations 5C3	Sum Ext. Bases 5B1a	Sum Ext. Cations 5A3a	Ca/10g 8D3	MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K						
	milliequivalents per 100g. soil										
21.8	14.7	4.9	7.0	<0.1	0.9	94	74	20.5	27.5	3.0	
25.0	17.5	5.8	5.8	0.1	0.5	96	80	23.9	29.7	3.0	
23.0	17.7	5.8	4.3	0.1	0.4	104	85	24.0	28.3	3.0	
22.0	17.2	5.4	3.5	0.1	0.4	105	87	23.1	26.6	3.2	
21.3	17.3	5.3	3.3	0.1	0.4	108	88	23.1	26.4	3.3	
17.9		5.2	<0.1	0.1	0.4						
17.0		6.7	<0.1	0.1	0.3						
16.9		7.7	<0.1	0.2	0.4						

a. Few (Fe-Mn?) concr.
b. Few (Fe-Mn?) concr. Few carbonate concr. (CaCO₃?)

Soil type: Nora silty clay loam
 Soil No.: S59Nebr-26-2-(1-8)
 Location: 950 feet west and 200 feet south of Center Sec. 22, T28N, R4E,
 Dixon County, Nebraska. Northeast Nebraska Experiment Station.
 Physiography: Rolling loess hills.
 Relief: 50 to 100 feet.
 Slope: 6 percent southwest, convex.
 Parent material: Peorian loess.
 Drainage: Well.
 Permeability: Moderately slow.
 Land use: Cultivated.
 Described by and date: J. V. Drew, and J. A. Elder, June 25, 1959.

Lincoln

Lab. No. Horizon Depth

- | | | | |
|-------|------------------|--------|--|
| 11378 | A _{1p} | 0-5" | Very dark brown (10YR 2/2 moist) silty clay loam. Weak very fine granular structure. Friable moist, slightly hard dry. Abundant roots. No effervescence. Abrupt smooth boundary. |
| 11379 | A ₁₂ | 5-9" | Very dark grayish brown (10YR 3/2 moist) (crushed, 10YR 3/3 moist) silty clay loam. Moderate fine granular structure. Friable moist, slightly hard dry. No effervescence. Clear smooth boundary. |
| 11380 | A ₃ | 9-13" | Very dark grayish brown (10YR 3/2 moist) (crushed, 10YR 4/3 moist) silty clay loam. Moderate fine and very fine granular structure. Friable moist, slightly hard dry. No effervescence. Clear smooth boundary. |
| 11381 | B ₂₁ | 13-17" | Dark brown (10YR 4/3 moist, crushes to 10YR 4/4 moist) silty clay loam. Weak coarse and medium subangular blocky breaking to weak fine subangular blocky structure. Friable moist, hard dry. No effervescence. Clear smooth boundary. |
| 11382 | B ₂₂ | 17-22" | Dark brown (10YR 4/3 moist, crushes to 10YR 4/4 moist) silty clay loam. Weak medium subangular blocky structure. Friable moist, hard dry. No effervescence. Abrupt wavy boundary. |
| 11383 | B _{3ca} | 22-36" | Dark yellowish-brown (10YR 4/4 moist, same color when crushed) silty clay loam. Weak medium subangular blocky structure. Friable moist, slightly hard dry. Few medium distinct gray mottles. Common faint yellowish brown coarse iron stains. Violent effervescence, numerous hard dense concretions 1/8 to 3/8" in diameter. Gradual smooth boundary. |
| 11384 | C ₁ | 36-50" | Yellowish brown (10YR 5/4 moist)* silty clay loam. Weak coarse prismatic breaking to weak fine and medium subangular blocky structure. Very friable moist, soft dry. Few prominent reddish brown stains, common medium distinct gray mottles. Common faint yellowish brown iron stains. Violent effervescence, scattered hard line concretions. Gradual smooth boundary. |
| 11385 | C ₂ | 50-60" | Same as above except slightly softer consistency, dry. Fewer line concretions and more reddish brown iron-manganese stains. |

* Tending toward 2.5Y hue.

SOIL TYPE Nora LOCATION Dixon County, Nebraska
 silty clay loam

SOIL NOS. S-55-Nebr-26-2-(1-6) LAB. NOS. 2862-2867

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										2A2 > 2	TEXTURAL CLASS		
		1B1a		COARSE SAND		MEDIUM SAND		FINE SAND		VERY FINE SAND				SILT	CLAY
		VERY COARSE SAND	COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	VERY FINE SAND	VERY FINE SAND						
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002					
0-6	Ap	0.5	0.5	0.2	0.3	6.4	66.2	25.9	49.5	23.3	-	sil			
6-14	B21ca	0.5	0.2	0.1	0.3	5.1	69.6	24.2	49.2	25.7	-	sil			
14-23	B22ca	0.4	0.2	0.1	0.3	6.2	68.5	24.3	50.6	24.3	-	sil			
23-32	B23ca	0.1	0.2	0.1	0.3	4.5	69.5	25.3	50.0	24.2	-	sil			
32-40	Cca	0.2	0.1	-	0.1	4.5	70.5	24.6	50.3	24.8	-	sil			
40-60	C	0.1	0.1	-	0.2	4.6	69.9	25.1	48.7	26.0	-	sil			

pH 8C1a	ORGANIC MATTER					ELECTRICAL CONDUCTIVITY EC · 10 ³ MILLIMOS PER CM @25°C.	MOISTURE TENSIONS		
	6A1a		6B1a		EST% SALT (BUREAU CUP)		6E1a		4B2
	ORGANIC CARBON	NITROGEN	C/N	CaCO ₃ equivalent			GYPNUM no./100g. SOIL	1/10 ATMOS.	
1:1	1:5	1:10	%	%	%	%	%	%	%
8.0	8.4	8.6	1.08	.113	9.6		9		12.3
8.0	8.5	8.7	0.48	.054	8.9		11		11.6
8.1	8.5	8.7	0.35	.040	8.8		10		11.8
8.1	8.5	8.8	0.31	.036	8.6		8		12.5
8.1	8.6	8.8	0.20				8		11.4
8.2	8.5	8.8	0.19				8		11.7

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	MOISTURE AT SATURATION %
	602b		6P2a		6Q2a		
	Ca	Mg	H	Na	K		
	← milliequivalents per 100g. soil →						
21.4		3.3		-	0.7		
19.2		4.1		0.1	0.4		
19.6		5.9		0.2	0.4		
20.8		7.7		0.1	0.4		
20.5		8.8		0.1	0.4		
20.2		8.8		0.1	0.5		

Soil type: Mora silty clay loam

Soil No.: S55Nebr-26-2-(1-6)

Location: .15 mile north and 175 feet east of west quarter corner Sec. 14, T27N, R4E, Dixon County, Nebraska; about 100 feet upslope from site of profile S55Nebr-26-1.

Physiography: Gently rolling to rolling loess plain; near middle of an 800-foot long west-southwest facing slope.

Use: Cultivated, corn.

Collected by: D. W. DeMoude, H. L. Kollmorgen, B. H. Williams, J. A. Elder, R. D. Greenawalt, T. F. Clapper and J. S. Allen, July 1955.

Described by: B. H. Williams.

Horizon and

Mandan

Lab. Number

- Ap
2862 0 to 6 inches. Grayish brown to dark grayish brown (2.5Y 5/2 dry to 4/2 moist) silty clay loam; weak fine and very fine crumb structure; slightly hard, dry; friable, moist; calcareous; violent effervescence; a few hard small concretions; abrupt smooth lower boundary. This layer consists mainly of B horizon material in which some organic matter has been incorporated through tillage.
- B21ca
2863 6 to 1 1/4 inches. Light yellowish brown to olive brown (2.5Y 6/3 dry to 4/3 moist) silty clay loam; few faint fine gray, yellowish brown and strong brown mottles; weak to moderate medium prismatic and weak coarse and medium blocky structure; calcareous; thin seams and streaks of segregated soft lime and fairly abundant hard concretions 2 to 5 mm. in diameter; violent effervescence; clear smooth lower boundary.
- B22ca
2864 1 1/4 to 23 inches. Light yellowish brown to olive brown (2.5Y 6/4 dry to 4/4 moist) silty clay loam; common distinct fine and medium gray and yellowish brown mottles and a few very fine soft iron-manganese concretions; weak medium prismatic and medium and fine blocky structure; slightly hard, dry; friable, moist; plant roots common to many in this horizon and the ones above; calcareous; violent effervescence; abundant hard lime concretions 2 to 4 mm. in diameter; gradual wavy lower boundary.
- B23ca
2865 23 to 32 inches. Light yellowish brown to light olive brown (2.5Y 6/4 dry to 5/4 moist) silt loam; many prominent medium and fine gray, yellowish brown and strong brown mottles; weak coarse prismatic and weak medium subangular blocky; slightly hard, dry; friable, moist; a few living plant roots, old root channels common; calcareous; violent effervescence; fewer lime concretions than in horizon above; gradual wavy lower boundary.
- Cca
2866 32 to 40 inches. Light yellowish brown to light olive brown (2.5Y 6/4 dry to 5/4 moist) silt loam; common distinct medium gray and yellowish brown mottles and dark brown to black soft iron-manganese concretions; weak coarse prismatic structure; slightly hard, dry; friable, moist; many root channels; calcareous; violent effervescence; a few hard lime concretions.
- C
2867 40 to 60 inches. Pale yellow to light yellowish brown (2.5Y 7/4 dry to 6/4 moist) silt loam; common faint to prominent fine and medium yellowish brown and strong brown mottles and iron-manganese streaks and seams and a few fine dark brown concretions; massive; soft, dry; friable, moist; calcareous; old root channels and pores common, some of which are filled with lime carbonate.

Horizons Ap, B22ca and Cca sampled for Bureau of Public Roads.

SOIL TYPE Pawnee LOCATION Pawnee County, Nebraska
 clay loam

SOIL NOS. S58Nebr-67-1-(1-7) LAB. NOS. 9132-9138

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1R1a	2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.001	
0-7	Alp	0.9	3.8a	4.8a	6.8a	4.5a	52.7	26.5	36.2	24.5	-	s11
7-11	Al2	1.5	4.1a	4.2a	5.5a	3.9a	50.4	30.4	31.5	25.6	-	s1c1
11-17	AB	1.7	3.8a	3.7a	5.4a	3.9a	38.3	43.2	24.4	20.6	Tr.	c
17-28	B21	2.0	3.5a	3.6a	6.5a	4.6a	34.4	45.4	23.2	18.9	Tr.	c
28-38	B22	7.6c	5.0b	4.0b	7.6b	5.2b	27.8	42.8	20.8	16.0	15	c
38-48	B3	2.2c	4.9b	5.1b	9.5b	6.7b	31.5	40.1	28.3	14.4	Tr.	c/c1
48-63	C	2.0c	4.5b	4.9b	9.4b	6.9b	33.4	38.9	25.1	19.7	2	c1

8C1a		ORGANIC MATTER			6C1a	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	6E1a	MOISTURE TENSIONS				
pH	1:1	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	Free Iron as Fe ₂ O ₃ %	CoCO ₃ equiv. %	GYPSUM mg./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
5.7				1.93	0.157	12.3	1.2	0.3				10.6
5.4				1.17	0.099	11.8	1.4	0.4				11.7
5.6				0.71	0.064	11	1.9	0.4				16.8
6.9				0.51	0.042	12	2.3	0.5	< 1			18.3
7.9				0.25			2.6	0.8	1			18.4
8.0				0.09			1.8	1.0	1			17.0
7.8				0.05			2.0	1.6	1			17.3

5A1a	EXTRACTABLE CATIONS					5I2	SAT. EXT. SOL.		4B4	4A1a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6R2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a	Field State Water	Vol. Wt.	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K		me.	K	%	g/cc	
	milliequivalents per 100g. soil						me. per liter				
18.8	12.4	3.9	9.3	0.1	0.4	< 1	0.5	0.1			49.3
18.9	11.0	4.3	8.6	0.3	0.2	1	1.6	0.1			54.3
26.1	16.9	7.0	6.6	1.0	0.4	3	2.0	0.1			83.0
28.1	21.0	8.5	3.3	1.7	0.3	5	3.2	0.1	23.5	1.54	83.6
28.7		9.0	1.2	2.6	0.3	8	5.5	0.1			73.6
26.6		8.0	0.8	2.9	0.3	9	6.6	0.1	19.4	1.68	81.4
24.0		7.6	0.8	3.0	0.2	9	9.6	0.1			78.6

a. Few smooth light to dark brown concr. (Fe?)
 b. Few smooth light to dark brown concr. (Fe?); few CaCO₃ concr.
 c. Few CaCO₃ concr.

Soil Type: Pawnee clay loam

Classification: Brunizem

Location: 0.2 miles west and 160 feet south of center of Sec. 19, T2N, R12E, located about 2 miles east and 1 mile north of Pawnee City, Pawnee County, Nebraska.

Date Sampled: September 11, 1958.

Collectors: R. Jordan, J. Elder, R. Greenawalt.

Use: Cultivated (corn 1958).

Climate: Average annual precipitation 31 inches, average annual temperature 53° F.

Parent Material: Glacial till.

Physiography: Glacial upland (loess-covered ridge tops).

Slope: 6 percent west.

Soil No.: 558Nebr-67-1-(1-7)

Lincoln

Lab.No. Horizon

- | | | |
|------|-----|---|
| 9132 | Alp | 0-7 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) clay loam; moderate fine and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary. |
| 9133 | A12 | 7-11 inches. Dark grayish brown (10YR 4/2 dry) to very dark gray (10YR 3/1 moist) clay loam; moderate medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; gradual smooth lower boundary. |
| 9134 | AB | 11-17 inches. Dark brown (7.5YR 4/2 dry) to dark brown (10YR 3/3 moist) clay; a few fine prominent olive brown mottles; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary. |
| 9135 | B21 | 17-28 inches. Dark yellowish brown (10YR 4/4 dry) to dark yellowish brown (10YR 3/4 moist) clay; moderate medium and fine blocky structure; the sides of the blocks are slicked and at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary. |
| 9136 | B22 | 28-38 inches. Yellowish brown (10YR 5/6 dry) to dark yellowish brown (10YR 4/4 moist) clay with a few gravels and many medium distinct grayish brown mottles; weak coarse blocky structure; the sides of the blocks are slicked and at a 45° angle; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary. |
| 9137 | B3 | 38-48 inches. Mottled 50% light brownish gray (2.5Y 6/2 dry), 50% yellowish brown (10YR 5/8 dry) to 50% grayish brown (2.5Y 5/2) and 50% yellowish brown (10YR 5/6 moist) clay; weak medium blocky structure; very hard dry, very firm moist; weakly calcareous; with a few soft lime concretions; gradual smooth lower boundary. |
| 9138 | C | 48-63 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) clay; many coarse distinct yellowish brown mottles; moderate medium and coarse blocky structure; very hard dry, firm moist; disseminated lime with large to small lime masses. |

Note: Dark material has been carried down into the AB and B21 horizons in cracks and cleavage plains from the surface. The dry colors were crushed. Many dark coatings and concentrations of dark material, probably iron and manganese, are present in the C horizon. Horizons Alp, B21 and C were sampled for Bureau of Public Roads.

SOIL TYPE Pawnee LOCATION Pawnee County, Nebraska

clay loam

SOIL NOS. S58Nebr-67-3-(1-8) LAB. NOS. 9148-9155

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2		
0-6	Alp	1.2a	4.1a	5.6a	8.9a	4.9a	50.0	25.3	37.7	21.8	Tr.	s11/1	
6-10	Al2	2.3a	4.1a	4.7a	7.0a	4.2a	45.5	32.2	31.7	21.6	Tr.	cl	
10-14	AB	2.2a	3.6a	4.0a	6.5a	4.3a	42.7	36.7	29.0	21.3	Tr.	cl	
14-24	B21	2.1a	4.1a	3.5a	6.1a	3.8a	32.7	47.7	22.8	16.6	Tr.	c	
24-32	B22	4.3a	4.2a	4.2a	7.5a	5.0a	29.5	45.3	22.7	15.4	4	c	
32-45	B23	3.2b	5.2b	5.2b	8.9b	5.8b	30.0	41.7	23.7	16.2	3	c	
45-53	B3	2.2b	4.8b	5.1b	9.8b	6.5b	30.6	41.0	25.0	16.6	Tr.	c	
53-63	C	2.9b	4.5b	5.4b	9.9b	7.0b	31.8	38.5	26.6	16.9	Tr.	cl	

pH		ORGANIC MATTER			6C1a	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMOS PER CM	6E1a	MOISTURE TENSIONS			
8C1a		6A1a	6B1a		Free Iron as % Fe ₂ O ₃	8A1a	CoCO ₃ equiv. percent	GYPSUM mg./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:1	1:5	ORGANIC CARBON %	NITROGEN %	C/N					%	%	%
5.5		2.03	0.165	12.3	1.2	0.4					10.9
5.5		1.59	0.128	12.4	1.6	0.3					13.6
5.5		1.28	0.108	11.8	1.7	0.3					15.1
6.2		0.69	0.057	12	2.2	0.4					19.9
7.2		0.47			2.6	0.5			Δ		19.0
8.1		0.19			2.1	0.7			2		17.6
8.1		0.08			2.6	0.7			2		17.8
8.0		0.02			2.4	0.7			1		17.1

5A1a	EXTRACTABLE CATIONS 5B1a					5C1a SAT. EXT. SOL.			4B1a	4A1a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	6F1a	6G1a		Field State Water	Vol. Wt. g/cc	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K	EXCH. No %	No	K	%		
	milliequivalents per 100g. soil					← me. per liter →					
18.8	11.3	3.0	6.5	0.1	0.5	Δ	0.6	0.2			50.1
21.3	13.7	4.1	8.6	0.2	0.3	1	0.9	0.1			54.4
24.3	14.9	4.7	9.0	0.3	0.3	1	1.1	0.1			59.5
30.7	22.0	6.9	6.2	1.2	0.4	4	1.5	0.1		26.1	1.48
29.8	23.5	7.1	2.5	1.7	0.3	5	3.2	0.1			71.5
27.6		6.6	0.8	2.4	0.3	7	4.4	0.1			68.2
25.5		6.1	0.8	3.0	0.3	10	4.6	0.1		20.5	1.62
23.2		5.2	0.4	2.2	0.3	8	4.5	0.1			79.6
											73.3

a. Trace smooth and irregular light brown to black concr. (Fe-Mn?)
 b. Trace smooth and irregular light brown to black concr. (Fe-Mn?); few CaCO₃ concr.

Soil Type: Pawnee clay loam

Classification: Brunizem

Location: 0.3 miles west and 350 feet south of NE corner Sec. 2, T2N, R11E, about 4 miles north of Pawnee City, Pawnee County, Nebraska.

Date Sampled: September 12, 1958.

Collectors: R. Jordan, R. Greenawalt.

Use: Cultivated (wheat 1958).

Climate: Average annual precipitation 31 inches; average annual temperature 53° F.

Parent Material: Glacial till.

Physiography: Glacial upland (loess-covered ridge tops).

Slope: 6 percent west.

Soil No.: S58Nebr-67-3-(1-8)

Lincoln

Lab. No. Horizon

- | | | |
|------|-----|--|
| 9148 | Alp | 0-6 inches. Dark grayish brown (10YR 4/2 dry) to very dark brown (10YR 2/2 moist) clay loam; moderate fine and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary. |
| 9149 | A12 | 6-10 inches. Very dark grayish brown (10YR 3/2 dry) to very dark brown (10YR 2/2 moist) clay loam; moderate medium granular structure; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary. |
| 9150 | AB | 10-14 inches. Dark yellowish brown (10YR 3/4 dry) to dark brown (10YR 3/3 moist) clay with a few fine prominent dark red mottles; moderate medium and fine blocky structure; hard dry, friable moist; noncalcareous; gradual smooth lower boundary. |
| 9151 | B21 | 14-24 inches. Dark brown (10YR 3/4 dry) and dark brown (10YR 3/4 moist) clay with a few gravels; moderate coarse and medium blocky structure; the sides of the blocks are slicked and at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary. |
| 9152 | B22 | 24-32 inches. Dark yellowish brown (10YR 4/4 dry) and dark brown (10YR 4/3 moist) clay with a few gravels; weak coarse blocky structure; the sides of the blocks are slicked at a 45° angle; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary. |
| 9153 | B23 | 32-45 inches. Dark yellowish brown (10YR 4/4 dry) to yellowish brown (10YR 5/6 moist) clay with many medium distinct weak red mottles; weak coarse blocky structure; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary. |
| 9154 | B3 | 45-53 inches. Mottled 50 percent light olive brown (2.5Y 5/4 dry) and grayish brown (2.5Y 5/2 moist) and 50 percent yellowish brown (10YR 5/8 dry), yellowish brown (10YR 5/6 moist) clay; weak medium blocky structure; very hard dry, very firm moist; noncalcareous except for a few medium-sized hard concretions; clear smooth lower boundary. |
| 9155 | C | 53-63 inches. Mottled 75 percent light olive brown (2.5Y 5/4 dry) to grayish brown (2.5Y 5/2 moist) and 25 percent yellowish brown (10YR 5/8 dry) to yellowish brown (10YR 5/6 moist) clay; seams and concretions of iron and manganese; moderate medium and coarse blocky structure; hard dry, firm moist; calcareous with a few medium and large soft concretions. |

Note: Horizons Alp, B21 and C were sampled for the Bureau of Public Roads.

SOIL TYPE Rosebud silt loam, deep LOCATION Kimball County, Nebraska

SOIL NOS. S57Nebr-53-1-(1-8) LAB. NOS. 5795-5802

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY					> 2 (19mm)
2.1	1.0-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002					
0-6	Alp	4.5	6.8	4.2	5.6	16.1	43.9	18.9	45.3	17.5	5	1	
6-8	Al2	5.6	6.9	4.0	5.6	15.0	43.5	19.4	43.9	17.3	5	1	
8-11	Bl	4.1	7.1	4.3	5.5	11.0	40.6	26.5	39.2	15.9	3	1	
11-20	B2	1.3	2.8	2.4	3.4	12.5	44.4	33.2	42.2	16.4	-	cl	
20-23	B3ca	0.8a	2.2b	2.4b	3.7b	15.6b	46.7	28.6	46.9	17.7	Tr.	cl	
23-28	C1	1.0a	3.6b	3.7b	5.9b	19.3b	45.3	21.2	51.2	16.9	Tr.	1	
28-34	D1	4.9a	10.9b	9.1b	12.1b	18.9b	29.7	14.4	44.8	10.3	3	fs1	
34-45	D2	35.7a	18.4b	8.1b	6.7b	6.1b	8.1	16.9	12.6	4.8	46	cos1	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS			
8C1b	8C1a	8C1a	6A1a	6B1a		EST. SALT (BUREAU CUP)	EC - 10 ³ MILLIMOS PER CM 8A1a	CoCO ₃ equiv. percent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
Saturated Paste	1:1	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N					%	%	%	
7.1	7.6	8.1	1.27	.109	11.6	<0.20	0.8	-				9.0	
6.9	7.3	7.7	1.20	.102	11.8	<0.20	0.7	-				9.2	
6.6	7.3	7.7	0.65	.064	10.2	<0.20	0.6	-				12.0	
6.7	7.6	8.0	0.52	.060	8.7	<0.20	0.6	-				16.3	
7.6	8.3	9.0	0.74	.091	8.1	<0.20	0.8	9				15.3	
7.7	8.5	9.2	0.35	.038	9.2	<0.20	0.8	12				12.3	
7.9	8.7	9.4	0.12			<0.20	0.9	8				7.3	
7.9	8.8	9.3	0.05			<0.20	1.0	8				8.8	
5A1a	EXTRACTABLE CATIONS 5B1a					5D2	SATURATION EXTRACT SOL			4A3a	8A		
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a		6P1a	6Q1a		Vol	MOISTURE AT SATURATION		
	Ca	Mg	H	Na	K	EXCH. No %	Na	K		Wt. g/cc	%		
	milliequivalents per 100g. soil						milliequivalents per liter						
16.8	13.3	2.1	4.7	-	2.1	-	0.2	1.5			39.0		
16.6	12.1	2.4	4.3	-	1.9	-	0.3	1.0			39.2		
19.1	12.9	4.1	3.2	-	2.0	-	0.4	0.8			45.0		
26.3	17.2	7.2	2.8	0.2	2.8	1	0.5	0.8		1.40	55.6		
23.8				0.3	3.0	1	1.0	1.2			53.8		
18.6				0.4	2.7	2	1.5	1.2		1.34	44.4		
13.3				0.5	2.1	3	2.8	1.2		1.40	31.2		
13.3				0.8	2.0	5	4.6	1.1			26.3		

a. Few CaCO₃ coner.

b. Few smooth black coner.(Fe-Mn); also few CaCO₃ coner.

Soil type: Rosebud silt loam, deep
 Location: Kimball County, Nebraska. 420 feet N and 0.15 mile E of SW corner, Sec. 9, T13N, R53W. About 9 miles S and 4 miles E of Dix, Nebraska.
 Topography: About 1 percent southwest facing slope on a gently undulating loess-covered Tertiary plain.
 Cultivated: Fallow, 1957.
 Described by: Ross D. Greenawalt and Bill McKinzie.
 Soil No.: S57Nebr-53-1-(1-8)
 Lincoln

Lab. No.	Horizon	Description
5795	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak fine granular structure; very friable, moist; abrupt smooth lower boundary.
5796	A12	6-8 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; friable, moist; clear smooth lower boundary.
5797	B1	8-11 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) light silty clay loam; compound prismatic and weak medium subangular blocky structure; firm, moist; abrupt smooth lower boundary. Broken clay skins on both vertical and horizontal faces.
5798	B2	11-20 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins in both vertical and horizontal faces.
5799	B3ca	20-23 inches. Light brownish gray (10YR 6/2.5 dry) to grayish brown (10YR 5/2.5 moist) light silty clay loam; weak coarse subangular blocky; friable, moist; strong effervescence; clear smooth lower boundary.
5800	C1	23-28 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2.5 moist) silt loam; weak medium subangular blocky structure; friable, moist; violent effervescence, disseminated lime present in root channels and along structural faces; clear smooth lower boundary.
5801	III	28-34 inches. Light gray (10YR 7/2 dry) to brown (10YR 5.5/3 moist) fine sandy loam; massive structure; friable, moist; violent effervescence; disseminated lime present in root channels.
5802	DE	34-45 inches. Pink (7.5YR 7/4 dry) to yellowish brown (10YR 5/4 moist) weathered Tertiary silts with high proportion of granitic gravel and sandy limestone fragments.

Note: Krotovinas 1-2 inches in diameter present through all horizons that are with dark colored material from surface horizons. Horizons Alp, B2 and C1 were sampled for the Bureau of Public Roads.

SOIL TYPE Rosebud LOCATION Kimball County, Nebraska
 loam, deep

SOIL NOS. S57Nebr-53-2-(1-7) LAB. NOS. 5803-5809

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a		COARSE SAND		MEDIUM SAND		FINE SAND		VERY FINE SAND			SILT
0-6	Alp	8.4	10.2a	6.9a	9.2a	16.3a	33.0	16.0	41.7	11.9	3	fsl	
6-10	E1	8.1	11.8a	7.2a	9.0a	13.3a	30.0	20.6	36.3	11.2	2	1	
10-20	B2	3.2	7.6a	5.6a	8.3a	16.4a	33.4	25.5	42.1	11.8	Tr.	1	
20-23	B3ca	1.4	5.7a	4.8a	9.2a	19.6a	35.1	24.2	47.2	12.5	-	1	
23-30	C1	1.4b	5.6c	5.5c	11.8c	22.7c	32.6	20.4	49.6	12.1	Tr.	1	
30-37	D1	4.9b	13.2c	9.8c	15.8c	19.6c	23.0	13.7	41.9	8.6	2	fsl	
37-45	D2	45.2b	31.8c	6.3c	3.3c	1.2c	1.9	10.3	3.3	1.0	20	lcos	

pH	ORGANIC MATTER					8A2 EST. SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHS PER CM @ 25°C	6E1a			MOISTURE TENSIONS		
	8C1b Saturated Paste	8C1a 1:1	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN C/N %			CaCO ₃ equiv. atom %	GYPSUM mg./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %	
7.3	7.9	8.3	1.00	.077	13.0	<0.20	0.9	-	-	-	-	7.6	
6.9	7.7	7.9	0.52	.048	10.8	<0.20	0.7	-	-	-	-	9.8	
6.9	7.5	8.0	0.53	.056	9.5	<0.20	0.6	-	-	-	-	11.6	
7.6	8.3	8.9	0.62	.068	9.1	<0.20	0.8	5	-	-	-	11.7	
7.7	8.5	9.2	0.33	.030	11.0	<0.20	0.8	12	-	-	-	10.7	
7.8	8.7	9.4	0.16	-	-	<0.20	0.8	8	-	-	-	6.9	
8.0	8.8	9.3	0.07	-	-	<0.20	1.0	7	-	-	-	5.7	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5D2 EXCH. No %	8A1 SATURATION EXTRACT SOL.		4A3a Vol Wt g/cc	9A MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6H1a H	6P2a No	6Q2a K		6P1a No	6Q1a K		
15.5	13.6	1.3	1.6	-	1.6	-	0.2	1.2	-	32.2
16.9	12.7	2.8	2.4	-	1.3	-	0.2	0.6	-	37.1
21.2	14.6	4.6	3.2	0.1	1.8	-	0.4	0.7	1.45	46.3
20.2				0.1	2.1	-	0.5	1.0		45.3
15.2				0.2	2.0	1	0.9	1.2	1.45	39.4
11.2				0.4	1.8	3	2.3	1.3		27.9
8.9				0.4	1.4	3	3.6	1.4	1.51	22.9

a. Few smooth black concr. (Fe-Mn).
 b. Few CaCO₃ concr.
 c. Few CaCO₃ concr., also few smooth black concr. (Fe-Mn).

Soil type: Rosebud loam, deep

Location: Kimball County, Nebraska. 0.23 mile N of SE corner, Sec. 27, T14N, R54W, and 75 feet NW 4th light pole N, SE corner Sec. 27, T14N, R54W. About 6 miles south of Dix, Nebraska.

Topography: About 1 percent very gentle north facing slope on a gently undulating loess-covered Tertiary plain.

Cultivated: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57/Nebr-53-2-(1-7)

Lincoln

Lab. No.	Horizon	
5803	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable moist; abrupt smooth lower boundary.
5804	B1	6-10 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak coarse sub-angular blocky structure; friable, moist; clear smooth lower boundary; broken clay skins present on vertical faces.
5805	B2	10-20 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2.5 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; continuous clay skins on both vertical and horizontal faces.
5806	B3ca	20-23 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) heavy silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; friable, moist; strong effervescence; clear smooth lower boundary; few broken clay skins on vertical faces.
5807	C1	23-30 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2 moist) silt loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; disseminated lime present in root channels and on face of aggregates.
5808	D1	30-37 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) fine sandy loam; massive structure; very friable, moist; violent effervescence; abrupt wavy lower boundary.
5809	D2	37-45 inches. Pink (7.5YR 7/4 dry) to light brown (7.5YR 6/4 moist) weathered Tertiary silts with high proportion of granitic gravel and limy sandstone fragments.

Note: Few coarse sand and fine gravels present throughout profile. Horizons Alp, B2 and C1 were sampled for the Bureau of Public Roads.

SOIL TYPE Rosebud LOCATION Kimball County, Nebraska
silt loam, moderately deep

SOIL NOS. 857Nebr-53-5-(1-7) LAB. NOS. 5828-5833

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.075	0.075-0.002	> 2 (< 19mm)	
0-4	Alp	2.1a	10.2	8.2	9.8	15.1	35.5	19.1	43.3	12.7	Tr.	1
4-11	B	1.0	5.7	6.2	8.6	14.7	33.5	30.3	41.6	11.5	Tr.	cl
11-15	Bca	0.9b	5.3b	5.5b	8.0b	16.6b	34.2	29.5	41.5	14.0	-	cl
15-19	C	2.2b	9.9b	7.8b	11.5b	18.7b	27.5	22.4	41.9	11.1	Tr.	scl
19-23	III	6.0c	15.4c	11.2c	13.9c	15.6c	20.5	17.4	35.7	8.3	4	sl
23-30	II	12.6c	17.3c	13.2c	15.6c	11.1c	13.8	16.4	27.0	6.3	20	sl

8C1b Saturated Paste	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIAMPS PER CM	6E1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a		EST. SALT (BUREAU CUP)	CoCO ₃ equiv-gram	GYPSUM mg./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:1	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N				%	%	%
7.4	7.8	8.3	1.17	.111	10.5	<0.20	0.7	-			8.4
7.0	7.5	8.0	0.79	.080	9.9	<0.20	0.6	1			13.4
7.6	8.2	8.7	1.02	.104	9.8	<0.20	0.6	18			14.7
7.7	8.2	9.0	0.41	.043	9.5	<0.20	0.6	17			10.8
7.7	8.3	9.1	0.21	.020	10.5	<0.20	0.6	12			8.1
7.8	8.5	9.2	0.16	.014	11.4	<0.20	0.7	17			7.2

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5B1a	5D2	SATURATION EXTRACT SOL.		4A3a	8A
	6N2b	6O2b	6H1a	6P2a	6Q2a		EXCH. No %	6P1a	6Q1a	Vol Wt. g/cc	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K			Na	K		
17.4	16.7	1.1	1.6	-	1.6	-	-	0.2	1.0		36.4
25.2	20.2	4.2	2.4	-	1.3	-	-	0.2	0.4	1.34	54.6
19.4				-	1.2	-	-	0.3	0.6		57.6
14.7				-	1.3	-	-	0.3	0.8	1.48	39.9
12.5				-	1.4	-	-	0.4	1.0		31.5
10.1				-	1.2	-	-	0.6	1.2		28.3

a. Organic matter
b. Few CaCO₃ concr.
c. Common CaCO₃ concr.

Soil type: Rosebud silt loam, moderately deep

Location: Kimball County, Nebraska. 720 feet east and 135 feet north of S1/4 corner Sec. 4, T13N, R55W. About 8 miles south and 1.5 miles east of Kimball, Nebraska.

Topography: About 1 percent slope in a gently undulating loess-covered weathered Tertiary plain.

Cultivated: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-5-(1-7)

Lincoln

Lab. No.	Horizon	
5828	Alp	0-4 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silt loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5829	B	4-11 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3.5/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; clear smooth lower boundary; numerous 10YR 3/2 moist worm casts about 5 mm. in diameter. Continuous clay skins on vertical faces. Broken clay skins on horizontal faces.
5830	Bca	11-15 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse subangular blocky and weak medium subangular blocky structure; very friable, moist; violent effervescence; clear smooth lower boundary; few small gravels present.
5831	C	15-19 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam; weak coarse subangular blocky; very friable, moist; violent effervescence; clear smooth lower boundary.
5832	D1	19-23 inches. Very pale brown (10YR 7/3 dry) to light yellowish brown (10YR 6/4 moist) sandy loam; massive structure; very friable, moist; violent effervescence; gradual smooth lower boundary; scattered lime-covered gravels and sandstone fragments.
5833	D2	23-30 inches. Very pale brown (10YR 7/3 dry) to light yellowish brown (10YR 6/4 moist) gravelly sandy loam; massive structure; violent effervescence; abrupt smooth lower boundary. Horizon consists of considerable lime-covered gravels and calcareous sandstone fragments. Ten percent of horizon consists of gravels over 3/4 inch in diameter.
	D3	Semiconsolidated Tertiary.

Note: Horizons Alp, B and D1 were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud LOCATION Kimball County, Nebraska
loam, mod. deep

SOIL NOS. S57Nebr-53-6-(1-4) LAB. NOS. 5834-5836

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1				2A2				
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2	< 19mm		
2-1	.05	0.5-0.25	0.75-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-7	Alp	5.7a	9.1a	7.9a	11.3a	17.1a	32.0	16.9	43.3	11.2	5	1
7-15	Bca	2.8b	8.5b	7.4b	11.2b	16.5b	29.8	23.8	40.0	11.6	Tr.	1
15-26	Cl	4.0a	9.5a	8.1a	12.5a	16.7a	28.3	20.9	39.9	11.1	3	1

8C1b Saturated Paste	pH		ORGANIC MATTER			8A2 ESTS SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC+103 MILLIMHOS PER CM 8A1a	6B1a CaCO ₃ equiv- alent	GYPSUM mg./100g. SOIL	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	4B2							
	1:1	1:10	ORGANIC CARBON %	NITRO- GEN %	C N					1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
7.6	8.0	8.6	1.30	.126	10.3	<0.20	0.7	7				9.7
7.5	8.1	8.7	0.75	.092	8.2	<0.20	0.7	13				12.5
7.6	8.3	8.9	0.42	.049	8.6	<0.20	0.6	14				10.1

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5D2 EXCH. No %	6A1 SATURATION		4A3a Vol Wt. g/cc	8A MOISTURE AT SATU- RATION %
	6P2a		6Q2a				6P1a	6Q1a		
	Ca	Mg	H	Na	K		Na	K		
17.1				-	1.2	-	0.3	0.7		
16.4				-	0.9	-	0.3	0.5	1.31	40.3
14.0				-	0.9	-	0.4	0.6		47.3
										42.0

a. Common CaCO₃ concr.
b. Few CaCO₃ concr.

Soil type: Rosebud loam, moderately deep

Location: Kimball County, Nebraska. 0.35 mile east SW corner (100 feet north center of road and 35 feet east of trail), Sec. 3, T13N, R53W. About 8 miles south and 5.5 miles east of Dix, Nebraska.

Topography: Three to four percent south facing slope in weathered Tertiary sands and silts on the Tertiary plains.

Cultivated: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-6-(1-4)

Lincoln

Lab.No.	Horizon	
5834	Alp	0-7 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5835	Bca	7-15 inches. Light gray (10YR 7/2 dry) to grayish brown (10YR 5/2 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; clear smooth lower boundary; few worm casts present; broken clay skins on vertical faces.
5836	Cl	15-26 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) loam; weak coarse subangular blocky structure; very friable, moist; violent effervescence; abrupt wavy lower boundary. Several Krotovinas present, filled with dark colored material of surface horizons.
	Dr	26+ inches. Semiconsolidated Tertiary consisting of lime-coated sandstone fragments ranging from 5-mm. to 10-12 inches in diameter with a loamy sand 7.5YR 6/6 moist, matrix. The upper 2-3 inches of this horizon has the fragments coated with thick layers of lime.

Note: Tertiary fragments present throughout profile, being much more numerous in lower horizons. Range in size from 3 to 15-mm. Horizons Alp, Bca and Cl were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. 4/7/58

SOIL TYPE Rosebud LOCATION Kimball County, Nebraska
loam, mod. deep

SOIL NOS. S57Nebr-53-7-(1-5) LAB. NOS. 5837-5841

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		5A1						2A2		
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002 (< 9µm)	> 1	
0-6	Alp	4.5a	9.7a	5.0a	12.3a	13.6a	33.4	17.5	44.0	9.7	3	1
6-10	Al2	4.2a	10.1a	8.0a	11.7a	16.0a	31.2	18.8	41.4	11.2	2	1
10-16	Bca	2.8b	5.6b	4.2b	6.1b	10.7b	38.7	31.9	34.8	17.5	1	cl
16-28	Cl	4.1b	8.7b	6.6b	9.5b	13.4b	33.2	24.5	36.1	15.1	2	1
28-34	D	19.3b	16.9b	9.7b	13.3b	14.0b	18.3	8.5	29.8	9.0	1	cosl

8C1b Saturated Paste	pH 8C1a	8C1a 1:10	ORGANIC MATTER			8A2 EST% SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC-10 ³ MILLIMETERS PER CM 8A1a	8E1a CaCO ₃ equiv- alent %	GYPSUM mg./100g. SOIL	MOISTURE TENSIONS		
			6A1a ORGANIC CARBON %	6B1a NITRO- GEN %	C/N					1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
			8C1b 1:1	8C1a 1:10	8C1a 1:10					8C1a 1:10	8C1a 1:10	8C1a 1:10
7.6	8.0	8.6	1.20	.111	10.8	<0.20	0.8	2			8.5	
7.5	7.9	8.5	1.12	.109	10.3	<0.20	0.7	2			9.5	
7.5	8.0	8.6	1.02	.125	8.2	<0.20	0.6	19			16.0	
7.5	8.1	8.8	0.70	.075	9.3	<0.20	0.6	18			12.8	
7.8	8.3	8.9	0.24			<0.20	0.6	18			6.2	

5A1a CATION EXCHANGE CAPACITY NHL Ac	EXTRACTABLE CATIONS					5D EXCH. % %	8A SATURATION EXTRACT SOL.		4A3a Vol wt. g/cc	8A MOISTURE AT SATU- RATION %
	6P2a		6Q2a				6P1a	6Q1a		
	Ca	Mg	H	Nb	K		Na	K		
17.2					1.6	-	0.2	1.2		
18.6					1.2	-	0.2	0.6		
20.2					0.7	-	0.2	0.3	1.23	56.4
16.1					0.7	-	0.2	0.3		49.4
10.2					0.8	-	0.3	0.4		29.1

a. Few CaCO₃ concr.
b. Common CaCO₃ concr.

Soil type: Rosebud loam, moderately deep

Location: Kimball County, Nebraska. 0.1 mile west and 120 feet north of SE corner Sec. 35, T13N, R54W. About 13 miles south and 1 mile east of Dix, Nebraska.

Topography: About a 2 percent south facing slope in weathered Tertiary sands and silts on the Tertiary plains.

Cultivation: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-7-(1-5)

Lincoln

Lab. No.	Horizon	Description
5837	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to dark brown (10YR 3/3 moist) loam; weak fine granular; very friable, moist; slight effervescence; abrupt smooth lower boundary; this horizon appears to be overblow.
5838	Al2	6-10 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam; weak coarse subangular blocky structure; very friable moist; slight effervescence; abrupt smooth lower boundary.
5839	Bca	10-16 inches. Light grayish brown (10YR 6/2 moist) to dark grayish brown (10YR 4/2 moist) silt loam; compound weak coarse prismatic and weak medium subangular blocky structure; very friable, moist; violent effervescence; clear wavy lower boundary.
5840	Cl	16-28 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) loam; weak medium and coarse subangular blocky structure; very friable, moist; violent effervescence; gradual smooth lower boundary.
5841	Dr	28-34 inches. Friable Tertiary material consisting of lime-covered sandstone fragments ranging from 5- to 25-mm. in size. Matrix consists of 7.5YR 7/4 moist, loam; few fine to coarse gravels also present.

Note: Small Tertiary fragments scattered throughout profile being more abundant in lower horizons. Several Krotonines present down through profile filled with darker colored material from surface horizons. Horizons Alp, Bca and Cl were sampled for the Bureau of Public Roads.

SOIL TYPE Rosebud LOCATION Kimball County, Nebraska
 silt loam, moderat ly deep

SOIL NOS. S57Nebr-53-10-(1-5) LAB. NOS. 5850-5854

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002					2A2 > 2 ($\leq 9mm$)
0-4	Alp	0.6	5.0	5.7	10.0	16.9	37.8	24.0	45.8	14.2	Tr.	1	
4-12	B2	0.2	1.5	1.9	4.6	14.0	39.9	37.9	42.1	14.6	-	cl	
12-15	Bca	0.2a	0.8a	1.6a	5.2a	15.5a	42.6	34.1	43.8	17.5	-	cl	
15-22	Cl	0.4a	2.8a	5.5a	13.1a	20.7a	34.3	23.2	48.3	14.0	-	1	
22-28	Ill	8.1a	18.3a	15.7a	18.9a	11.5a	11.8	15.7	26.3	5.6	24	cosl	
		pH											
		8C1a		8C1a		8A2		6E1a		MOISTURE TENSIONS			
		1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N	EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv-alent %	GYPSUM mg./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
								8A1a					
6.7	7.1	7.5	0.99	.092	10.8	<0.20	0.6	-	-	-	-	-	10.1
6.8	7.2	7.7	0.73	.078	9.4	<0.20	0.7	-	-	-	-	-	16.5
7.6	8.1	8.9	0.88	.098	9.0	<0.20	0.7	16	-	-	-	-	16.0
7.9	8.4	9.2	0.33	.036	9.2	<0.20	0.7	15	-	-	-	-	11.5
8.0	8.5	9.4	0.12	.010	12.0	<0.20	0.9	13	-	-	-	-	6.5
		5A1a					5D2		8A1 SAT. EXT. SOL.		4A3a		8A
		6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a			Vol. Wt. g/cc	MOISTURE AT SATURATION %
		Ca	Mg	H	Na	K		Na	K				
		← milliequivalents per 100g. soil →						← milliequivalents per liter →					
18.5		12.8	3.3	2.8	-	1.7	-	0.3	0.9				
30.2					0.1	2.2	-	0.5	0.7		1.36	40.1	
22.7					0.2	2.0	1	0.8	1.0			63.4	
9.2					0.4	1.2	3	2.9	1.2			58.4	
												28.0	

a. Common CaCO₃ concn.

Soil type: Rosebud silt loam, moderately deep

Location: Kimball County, Nebraska. 330 feet east and 60 feet north SW corner Sec. 30, T13N, R56W. About 12 miles south and 7 miles west of Kimball, Nebraska.

Topography: About a 1 percent slope on a nearly level loess-covered Tertiary plain.

Cultivation: Fallow, 1957.

Described by: Ross D. Greenawalt and Bill McKinzie.

Soil No.: S57Nebr-53-10-(1-5)

Lincoln

Lab.No. Horizon

5850	Alp	0-4 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2.5 moist) silt loam; weak fine granular; very friable, moist; abrupt smooth lower boundary.
5851	B2	4-12 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) silty clay loam; compound weak coarse prismatic and moderate fine and medium subangular blocky structure; firm, moist; abrupt smooth lower boundary; 5-mm. worm casts present, filled with dark colored surface soil. Continuous clay skins on both vertical and horizontal faces.
5852	Bca	12-15 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) silt loam; compound weak coarse prismatic and weak fine and medium subangular blocky structure; friable, moist; violent effervescence; clear smooth lower boundary.
5853	C1	15-22 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2 moist) silt loam; weak coarse subangular blocky structure; very friable moist; violent effervescence; gradual smooth lower boundary; few Tertiary fragments and small pockets, coarse sand found in horizon.
5854	D1	22-28 inches. Very pale brown (10YR 7/3 dry) to light yellowish brown (10YR 6/4 moist) silt loam; massive structure; very friable moist; violent effervescence; abrupt wavy lower boundary. Horizon consists of limestone and lime-covered gravels. Consists of 60 percent fragments over 3/4 inch in diameter.
	D2	28+ inches. Semiconsolidated Tertiary with lenses and pockets of coarse sand.

Note: The surface 22 inches appears to be loessial material. Horizons Alp, B2 and C1 were sampled for the Bureau of Public Roads.

SOIL TYPE Sharpsburg LOCATION Cass County, Nebraska
silty clay loam

SOIL NOS. S54Nebr-13-2-(1-8) LAB. NOS. 2218-2225

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1b		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2			
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.007				
0-6	Alp	-	0.1	0.1	0.2	1.9	70.3	27.4	45.8	26.5	-	sic1
6-11	Al2	-	-	0.1	0.1	2.3	65.1	32.4	40.2	27.2	-	sic1
11-14	A3	-	0.1	0.1	0.1	1.7	61.9	36.1	36.0	27.7	-	sic1
14-21	B1	-	0.1	0.1	0.1	1.4	59.2	39.1	34.5	26.2	-	sic1
21-30	B21	-	-	0.1	0.1	1.7	56.6	41.5	31.8	26.5	-	sic
30-45	B22	-	-	0.1	0.2	2.5	60.4	36.8	35.8	27.1	-	sic1
45-53	B3	-	-	0.1	0.2	2.0	63.9	33.8	36.8	29.1	-	sic1
53-60	C	-	0.1	0.2	0.2	1.8	64.7	33.0	35.8	30.9	-	sic1
8C1b SATURATED PASTE	pH		ORGANIC MATTER			ESTD. SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC · 10 ³ MILLIMHOS PER CM	MOISTURE TENSIONS			4B2	
	8C1a 1:8	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	6B1a C/N			6C1a CoCO ₂ equivalent %	GYP SUM me./100g SOIL	1/10 ATMOS.		1/3 ATMOS.
5.2	5.8	5.9	1.79	.154	11.6	-	-	-	-	-	10.9	
5.3	5.9	6.0	1.77	.154	11.5	-	-	-	-	-	13.3	
5.4	6.0	6.2	1.51	.140	10.8	-	-	-	-	-	15.1	
5.6	6.3	6.4	1.14	.108	10.6	-	-	-	-	-	16.4	
5.7	6.5	6.6	0.69	.065	10.6	-	-	-	-	-	17.4	
6.0	6.7	7.1	0.31			-	-	-	-	-	16.6	
6.0	7.3	7.4	0.16			-	-	-	-	-	16.0	
6.2	7.1	7.4	0.12			-	-	-	-	-	15.8	
5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. %	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %			
	6K2b Ca	6Q2b Mg	6P2a H	6Q2a Na	6Q2a K							
	← milliequivalents per 100g. soil →					5C1						
20.7	11.2	3.8		0.1	1.2	79	16.3	2.9				
23.0	12.8	4.6		0.1	0.9	80	18.4	2.3				
24.8	14.9	5.9		0.1	0.6	87	21.5	2.5				
26.8	16.2	6.9		0.2	0.6	89	23.9	2.3				
29.1	18.2	8.4		0.1	0.7	94	27.4	2.2				
27.0	17.6	8.2		0.3	0.7	99	26.8	2.1				
26.4	17.8	8.0		0.3	0.6	100	26.7	2.2				
26.7	17.8	8.1		0.3	0.6	100	26.8	2.2				

a/ Particle size analyses by Beltsville Laboratory

Soil type: Sharpsburg silty clay loam
 Soil No.: ~~854~~ Nebr-13-2-(1-8)
 Location: .3 mile west and 200 feet north of southeast corner Sec. 30, T11N,
 R10E; 1 mile north and 2-3/4 miles east of Alvo, Cass County, Nebraska.
 Topography: 3 percent west facing slope in gently rolling loess-mantled till
 plain.
 Described by: B. H. Williams.

Mandan

Lab.

No.	Horizon	Depth	
2218	A _{1p}	0-6"	Dark grayish brown (1OYR 4.5/2, dry) to very dark brown (1OYR 2/2, moist) silty clay loam; moderate very fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
2219	A ₁₂	6-11"	Dark grayish brown (1OYR 4/2, dry) to very dark brown (1OYR 2/1.5, moist) silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
2220	A ₃	11-14"	Dark grayish brown (1OYR 3.5/2, dry) to very dark brown (1OYR 2.5/2, moist) heavy silty clay loam; weak coarse blocky separating to moderate to strong fine granular or very fine subangular blocky structure; slightly hard, dry; friable, moist; clear smooth lower boundary.
2221	B ₁	14-21"	Brown (1OYR 4/3, dry) to dark brown (1OYR 3/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and coarse blocky and strong very fine subangular blocky; hard, dry; firm, moist; gradual smooth lower boundary.
2222	B ₂₁	21-30"	Brown (1OYR 5/3, dry; 4/3, moist) heavy silty clay loam or silty clay; compound moderate coarse prismatic and coarse blocky structure; hard, dry; firm, moist; some very dark brown infiltration of material along vertical cracks, moderate glaze on faces of blocks; gradual smooth lower boundary.
2223	B ₂₂	30-45"	Pale brown (1OYR 6/3, dry) to brown (1OYR 5/3, moist) heavy silty clay loam or silty clay; few faint fine gray and yellowish brown mottles and fine iron-manganese spots; strong coarse and medium blocky with better-defined vertical than horizontal structure planes; a few fine root channels and pores; roots few but seem to penetrate the blocks readily; gradual wavy lower boundary.
2224	B ₃	45-53"	Light brownish gray (2.5Y 6/2, dry; 1OYR 6/2, moist) silty clay loam; common medium gray, strong brown and yellowish brown mottles (moist) and a few iron-manganese concretions; moderate coarse blocky structure; hard, dry; firm, moist; sprinkling of root channels and pores; a very few roots present; gradual wavy lower boundary.
2225	C	53-60"	Marbled gray, yellow and brown silty clay loam; some very dark brown iron-manganese spots and soft concretions; massive or weak subangular coarse blocky with a few fairly well defined structure planes; numerous fine pores and thread-like channels; only an occasional root.

SOIL SURVEY LABORATORY Mandan, N. Dak. 8/ 1/20/55

SOIL TYPE Sharpsburg LOCATION Cass County, Nebraska
silty clay loam

SOIL NOS. S54Nebr-13-1-(1-8) LAB. NOS. 2210-2217

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1b					3A1						2A2 > 2
		VERY COARSE SAND 2-1	COARSE SAND 1.0-5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002			
0-5	Alp	0.1	0.2	0.1	0.4	2.9	65.9	30.4	44.1	24.9	-	sic1	
5-10	All	-	-	0.1	0.2	2.1	62.1	35.5	38.8	25.5	-	sic1	
10-13	A3	-	-	0.1	0.2	1.8	58.4	39.5	34.4	26.0	-	sic1	
13-18	B1	-	-	-	0.1	1.3	57.0	41.6	32.4	25.9	-	sic	
18-28	B21	-	-	-	0.1	1.8	55.5	42.6	29.2	28.1	-	sic	
28-40	B22	-	-	-	0.2	1.9	60.7	37.2	34.7	28.0	-	sic1	
40-51	B3	-	-	-	0.1	1.7	63.2	35.0	35.1	29.8	-	sic1	
51-60	C	-	0.1	0.1	0.2	2.1	64.5	33.0	36.3	30.4	-	sic1	

801b SATURATED PASTE	pH		ORGANIC MATTER			ESTM. SALT (BUREAU CUP)	ELECTRI-CAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM	6K1a CoCO ₂ equivalent %	GYPSUM mg./100g. SOIL	MOISTURE TENSIONS		
	801a 1:5	801a 1:10	5A1a ORGANIC CARBON %	6K1a NITRO-GEN %	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
										%	%	%
5.3	6.1	6.2	2.15	.180	11.9							12.4
5.4	6.0	6.2	2.04	.170	12.0							14.8
5.4	5.8	6.2	1.71	.146	11.7							16.6
5.5	6.1	6.4	1.32	.132	10.0							17.6
5.6	6.1	6.6	0.73	.067	10.9							18.1
5.9	6.2	6.8	0.34									16.8
6.0	6.9	6.9	0.19									16.3
6.0	7.1	7.1	0.14									15.8

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %
	602b Ca	602b Mg	602a H	602a Na	602a K				
	milliequivalents per 100g. soil								
23.6	13.2	4.6		0.1	1.4	82	19.3	2.9	
26.2	15.2	5.6		0.1	0.7	82	21.5	2.7	
28.0	16.9	6.7		0.1	0.5	86	24.2	2.5	
28.0	17.2	7.8		0.1	0.4	91	25.5	2.2	
29.5	18.6	9.0		0.1	0.5	96	27.2	2.1	
27.9	17.8	8.9		0.2	0.5	98	27.4	2.0	
27.6	18.0	9.1		0.3	0.5	100	27.9	2.0	
27.4	17.5	8.9		0.3	0.5	99	27.2	2.0	

a/ Particle size analyses by Beltsville Laboratory.

Soil type: Sharpsburg silty clay loam
 Soil No.: S54Nebr-13-1-(1-8)
 Location: 500 feet south of east quarter corner Sec. 18, T10N, R11E; 4 miles east and .5 mile south of Elmwood, Cass County, Nebraska.
 Topography: About 3 percent west facing slope in gently rolling landscape.
 Land use: Cultivated, corn 1954.
 Described by: B. H. Williams.

Mandan

lab.

No. Horizon Depth

- 2210 A_{1p} 0-5" Dark grayish brown (10YR 4/1.5, dry) to very dark brown (10YR 2/2, moist) silty clay loam; moderate fine and very fine granular structure; soft, dry; friable, moist; abrupt smooth lower boundary.
- 2211 A₁₁ 5-10" Dark gray (10YR 3.5/1, dry) to very dark brown or black (10YR 2/1.5, moist) silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
- 2212 A₃ 10-13" Dark grayish brown (10YR 3.5/2, dry) to very dark brown (10YR 2.5/2, moist) heavy silty clay loam; strong fine granular structure; soft, dry; friable, moist; clear smooth lower boundary.
- 2213 B₁ 13-18" Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 3/2, moist) heavy silty clay loam; compound weak coarse prismatic and strong very fine subangular blocky structure; slightly hard, dry; friable, moist; nearly black crack filling around the coarse prisms; gradual wavy lower boundary.
- 2214 B₂₁ 18-28" Brown (10YR 5/2.5, dry) to dark brown (10YR 3/3, moist) heavy silty clay loam or silty clay; compound strong coarse prismatic, strong fine and very fine blocky structure; hard, dry; firm, moist; very dark brown staining along the vertical structure planes and very dark grayish brown glaze on the coarse blocks; gradual wavy lower boundary.
- 2215 B₂₂ 28-40" Brown (10YR 5.5/3, dry) to brown (10YR 4/3, moist) heavy silty clay loam or silty clay; compound strong coarse prismatic; strong coarse and moderate medium and fine blocky structure; hard, dry; firm, moist; some dark brown staining along vertical planes; gradual wavy lower boundary.
- 2216 B₃ 40-51" Pale brown (10YR 6/3.5, dry) to brown (10YR 5/3, moist) silty clay loam; few faint fine gray and strong brown mottles; compound weak coarse prismatic and moderate coarse blocky structure; hard, dry; firm, moist; gradual wavy lower boundary.
- 2217 C 51-60" Very pale brown (10YR 6.5/3, dry) to brown (10YR 5/3, moist) silty clay loam; many distinct, gray, strong brown and yellowish brown mottles and very dark brown to black iron-manganese soft concretions; massive, except an occasional vertical crack; slightly hard, dry; firm, moist.

SOIL SURVEY LABORATORY Lincoln, Nebr. February 1959

SOIL TYPE Sharpsburg LOCATION Saunders County, Nebraska
silty clay loam

SOIL NOS. S58Nebr-78-3-(1-11) LAB. NOS. 8430-8440

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											2A2 > 2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	3A1				
0-8	A1p	0.1a	0.1a	0.1a	0.2a	4.7a	62.0	32.8	44.8	22.0	-	sic1	
8-12	B1	<0.1	<0.1	<0.1	<0.1	3.5a	52.1	44.4	35.3	20.3	-	sic	
12-19	B21	<0.1	<0.1	<0.1	0.1a	4.1a	54.9	40.9	38.9	20.2	-	sic	
19-30	B22	<0.1	<0.1	<0.1	0.2a	4.6a	59.0	36.2	41.6	22.2	-	sic1	
30-40	B23	<0.1	<0.1	<0.1	0.2a	4.4a	59.6	35.8	41.3	22.9	-	sic1	
40-45	B3	<0.1	<0.1	<0.1	0.3a	5.7a	61.1	32.9	44.7	22.3	-	sic1	
45-54	C1	<0.1	0.1a	<0.1	0.3a	4.6a	62.9	32.1	43.8	23.9	-	sic1	
54-60	C2	<0.1	<0.1	<0.1	0.3a	4.8a	65.5	29.4	46.7	23.8	-	sic1	
60-72	C3	<0.1	<0.1	<0.1	0.4a	5.6a	65.0	29.0	48.0	22.9	-	sic1	
72-96	C4	<0.1	0.1a	0.1a	0.3a	5.3a	66.5	27.7	47.3	24.7	-	sic1	
PH		ORGANIC MATTER					ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM	GELS		MOISTURE TENSIONS			
8C1a		1:5	1:10	6A1a ORGANIC CARBON	6B1a NITROGEN	C/N	0A1a	CaCO ₃ equiv. percent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
				%	%			%		%	%	%	
5.9				1.81	0.157	11.5	0.4					13.4	
5.8				1.10	0.101	10.9	0.3					18.0	
6.0				0.73	0.070	10	0.3					16.8	
6.3				0.38	0.046	8	0.3					15.7	
6.4				0.21			0.3					16.2	
6.6				0.16			0.3	∇				15.2	
6.7				0.12			0.4	∇				14.9	
6.8				0.08			0.4	∇				14.2	
6.8				0.08			0.4	∇				13.9	
6.9				0.08			0.4	∇				13.6	
5A1a		EXTRACTABLE CATIONS					5B1a	BASE SAT. % NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a	5A3a Sum Cat-	8D3 Ca/Mg	8A MOISTURE AT SATURATION %
CATION EXCHANGE CAPACITY NH ₄ Ac		6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K			Sum Bases	Sum Cations			
		milliequivalents per 100g. soil					5C1	5C3	← me/100 g →				
21.9		13.2	5.2	7.7	<0.1	1.4	90	72	19.8	27.5	2.5	55.8	
29.2		17.8	7.7	7.5	0.1	0.8	90	78	26.4	33.9	2.3	77.3	
27.1		17.5	8.1	5.8	0.1	0.7	97	82	26.4	32.2	2.2	76.4	
24.8		16.8	7.9	4.1	0.1	0.7	103	86	25.5	29.6	2.1	68.8	
25.1		17.7	8.5	3.3	0.2	0.7	108	89	27.1	30.4	2.1	70.9	
24.9		17.2	7.7	2.9	0.2	0.7	104	90	25.8	28.7	2.2	63.0	
23.8		17.5	7.4	2.1	0.2	0.7	108	92	25.8	27.9	2.4	59.2	
23.2		17.5	7.1	3.3	0.2	0.7	110	88	25.5	28.8	2.5	58.3	
22.9		17.6	7.1	2.5	0.2	0.7	112	91	25.6	28.1	2.5	58.9	
23.1		17.2	6.9	1.6	0.2	0.7	108	94	25.0	26.6	2.5	55.6	
a.		Common smooth black concr. (Mn?)											

Soil type: Sharpsburg silty clay loam
 Soil No.: 858Nebr-78-3-(1-11)
 Location: .1 mile west and 100 feet north of the southeast corner Sec. 5, T15N, R6E; approximately 2 miles north and 2 miles west of Malmo, Saunders County, Nebraska.
 Physiography: Dissected loess-mantled till plain.
 Relief: 50 to 60 feet.
 Slope: 2 percent smooth south facing convex slope.
 Parent material: Peorian loess.
 Erosion: Slight to moderate.
 Drainage: Well.
 Permeability: Moderately slow.
 Land use: Corn 1958.

Described by: W. E. McKinzie and J. A. Elder.

Horizon and
 Lincoln
 Lab. Number

A1p 0 to 8 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) silty clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
 8430

B1 8 to 12 inches. Dark brown (10YR 3/3 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam; strong fine subangular blocky; firm, moist; no effervescence; organic staining along aggregates and thin patchy clay skins on aggregates; clear smooth boundary.
 8431

B21 12 to 19 inches. Dark brown (10YR 4/3 moist) to brown (10YR 5/3 dry) silty clay loam; moderate medium prismatic to strong fine subangular blocks; firm, moist; no effervescence; thin continuous clay skins on aggregates; gradual smooth boundary.
 8432

B22 19 to 30 inches. Dark grayish brown (10YR 4/2 moist) to yellowish brown (10YR 5/4 dry) silty clay loam; moderate medium prismatic to moderate fine and medium blocky; firm, moist; no effervescence; thin continuous clay skins on aggregates; gradual smooth boundary.
 8433

B23 30 to 40 inches. Dark grayish brown (10YR 4/2 moist) to pale brown (10YR 6/3 dry) silty clay loam; moderate medium prismatic to moderate fine and medium blocky; friable, moist; no effervescence; few fine faint gray and yellowish brown mottles; clear smooth boundary.
 8434

B3 40 to 45 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; friable, moist; no effervescence; common fine distinct gray mottles; gradual smooth boundary.
 8435

C1 45 to 54 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; friable, moist; no effervescence; common medium distinct gray mottlings and few medium faint yellowish brown mottles; gradual smooth boundary.
 8436

C2 54 to 60 inches. Olive brown (2.5Y 4/4 moist) to light yellowish brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common medium faint yellowish brown and gray mottles; scattered iron and manganese concretions.
 8437

C3 60 to 72 inches. Olive brown (2.5Y 4/4 moist) to light grayish-brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common medium fine yellowish brown and gray mottles; few dark brown iron and manganese concretions; gradual smooth boundary.
 8438

C4 72 to 96 inches. Light olive brown (2.5Y 5/4 moist) to pale yellow (2.5Y 7/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common medium fine yellowish brown and gray mottles; few dark brown iron and manganese concretions; gradual smooth boundary.
 8439

SOIL TYPE Sharpsburg LOCATION Saunders County, Nebraska
silty clay loam

SOIL NOS. S58Nebr-78-6-(1-11) LAB. NOS. 8457-8467

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2 > 2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002					
0-6	Alp	<0.1	0.1a	0.1a	0.3a	6.0b	63.7	29.8	46.5	23.4	-	sic1	
6-10	B1	0.1a	0.2a	0.1a	0.1a	4.4b	57.2	37.9	38.1	23.5	-	sic1	
10-18	B21	<0.1	0.2a	0.2a	0.3a	4.3b	53.6	41.4	34.0	24.0	-	sic	
18-27	B22	0.1a	0.1a	0.1a	0.3a	6.1b	57.1	36.2	42.3	21.0	-	sic1	
27-32	B3	<0.1	0.1a	0.1a	0.3a	8.0b	58.1	33.4	46.0	20.3	-	sic1	
32-40	C1	<0.1	0.1a	0.1a	0.4a	8.3b	59.2	31.9	46.4	21.3	-	sic1	
40-50	C2	0.1a	0.1a	0.1a	0.5a	7.2b	59.6	32.4	45.1	22.1	-	sic1	
50-60	C3	<0.1	0.1a	0.1a	0.5a	5.7b	62.6	31.0	43.6	25.0	-	sic1	
60-84	C4	0.1a	0.2a	0.2a	0.5a	7.0b	64.2	27.8	49.8	21.7	-	sic1	
84-93	C5	<0.1	0.4a	0.4a	0.8a	6.5b	65.4	26.5	47.6	24.8	-	sil	
pH		ORGANIC MATTER					ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM @25°C	6E1a		MOISTURE TENSIONS			
8C1a		1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N		CoCO ₃ equivalent %	GYPSUM me./100g. SOIL	1:10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
1:1												4B2	
5.8				1.54	0.165	9.3	0.4					11.8	
5.8				1.24	0.113	11.0	0.4					15.2	
6.1				0.69	0.061	11	0.4					16.7	
5.2				0.34	0.043	7	0.4					15.3	
5.2				0.26			0.4					14.5	
6.4				0.21			0.3					14.4	
6.5				0.13			0.5					15.1	
6.6				0.12			0.5	Δ				14.7	
5.9				0.09			0.4	Δ				13.6	
7.0				0.08			0.4	Δ				14.4	
5A1a		EXTRACTABLE CATIONS					5B1a	BASE SAT. % NH ₄ Ac EXCH. 5C1	Base Sat. % on Sum Cations 5G3	5B1a Sum Bases 5G3	5A3a Sum Cat- ions	8D3 Ca/Mg	8A MOISTURE AT SATURATION %
CATION EXCHANGE CAPACITY NH ₄ Ac		6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K							
← milliequivalents per 100g. soil →													
20.3	11.8	4.1	7.7	<0.1	1.4	85	69	17.3	25.0	2.9		51.2	
24.3	14.8	6.0	7.4	<0.1	0.8	89	74	21.6	29.0	2.5		60.1	
27.1	17.0	7.5	6.2	0.1	0.7	93	80	25.3	31.5	2.3		66.5	
25.0	16.5	7.3	5.0	0.1	0.7	98	83	24.6	29.6	2.3		63.6	
23.7	16.1	6.8	4.5	0.1	0.7	100	84	23.7	28.2	2.4		65.9	
23.8	16.1	6.8	3.7	0.2	0.7	100	86	23.8	27.5	2.4		71.3	
24.5	17.3	7.2	2.9	0.3	0.9	105	90	25.7	28.6	2.4		63.3	
23.6	16.8	6.8	2.5	0.3	1.0	106	91	24.9	27.4	2.5		62.4	
23.1	16.4	6.9	2.0	0.3	1.1	107	92	24.7	26.7	2.4		55.8	
23.5	16.7	7.2	2.5	0.3	1.2	108	91	25.4	27.9	2.3		55.8	

a. Many smooth brown to black concr. (Fe-Mn?)
b. Few smooth brown to black concr. (Fe-Mn?)

Soil type: Sharpsburg silty clay loam

Soil No.: 858Nebr-78-6-(1-11)

Location: .2 mile north and 50 feet east of west quarter corner Sec. 17, T16N, R6E (east fourth light pole south of transformer pole); approximately 5 miles south of Morse Bluff, Saunders County, Nebraska.

Physiography: Dissected loess-mantled till plain.

Relief: 40 to 60 feet.

Slope: 2 percent smooth south-southwest facing convex slope.

Parent material: Peorian loess.

Erosion: Slight to moderate.

Drainage: Well.

Permeability: Moderately slow.

Land use: Corn 1958.

Described by: W. E. McKinzie and J. A. Elder

Horizon and

Lincoln

Lab. Number

- A1p
8457 0 to 6 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry) light silty clay loam; weak fine granular; friable, moist; no effervescence; abrupt smooth boundary.
- B1
8458 6 to 10 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam; weak coarse subangular blocky to moderate fine subangular blocky; friable, moist; no effervescence; clear smooth boundary.
- B21
8459 10 to 18 inches. Dark brown (10YR 4/3 moist) to brown (10YR 5/3 dry) silty clay loam; weak coarse subangular blocky to moderate medium subangular blocky; firm, moist; no effervescence; thin continuous clay skins on aggregates; gradual smooth boundary.
- B22
8460 18 to 27 inches. Dark grayish brown (10YR 4/2 moist) to brown (10YR 5/3 dry) silty clay loam; moderate medium prismatic to moderate fine and medium blocky; slightly plastic, wet; no effervescence; thin continuous clay skins on aggregates; few fine faint dark brown mottles; gradual smooth boundary.
- B3
8461 27 to 32 inches. Dark grayish brown (10YR 4/2 moist) to brown (10YR 5/3 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; slightly plastic, wet; no effervescence; thin patchy clay skins; few faint fine yellowish brown mottles; clear smooth boundary.
- C1
8462 32 to 40 inches. Dark grayish brown (2.5Y 4/2 moist) to grayish brown (2.5Y 5/2 dry) silty clay loam; weak coarse prismatic to weak medium subangular blocky; friable, moist; no effervescence; common fine and medium distinct yellowish brown mottles with scattered dark brown iron and manganese concretions; gradual smooth boundary.
- C2
8463 40 to 50 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) light silty clay loam; weak coarse prismatic; friable, moist; no effervescence; common fine and medium distinct yellowish brown mottles with scattered dark brown iron and manganese concretions; gradual smooth boundary.
- C3
8464 50 to 60 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 6/2 dry) light silty clay loam; weak coarse prismatic; friable, moist; no effervescence; common fine and medium distinct yellowish brown mottles with scattered dark brown iron and manganese concretions.
- C4
8465 60 to 84 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common fine distinct gray and yellowish brown mottles with higher percentage of gray mottles; gradual smooth boundary.
- C5
8466 84 to 93 inches. Light olive brown (2.5Y 5/4 moist) to light yellowish brown (2.5Y 6/4 dry) light silty clay loam; weak coarse prismatic; very friable, moist; no effervescence; common fine distinct gray and yellowish brown mottles with a high percentage of mottling being yellowish brown; gradual smooth boundary.

SOIL TYPE Sharpsburg LOCATION Washington County, Nebraska
 silt loam

SOIL NOS. S57Nebr-89-4-(1-7) LAB. NOS. 6278-6284

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a	3A1					2A2				
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY			> 2	
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002		
0-5	Alp	-	0.1a	-	-	1.5	66.5	31.9	38.8	29.2	-	sic1
5-12	Al2	0.2b	0.2b	0.1b	0.1b	1.1b	64.7	33.6	36.4	29.5	-	sic1
12-16	B1	0.3b	0.3b	0.2b	0.2b	0.9b	62.2	35.9	27.5	35.7	-	sic1
16-24	B21	0.2b	0.3b	0.2b	0.2b	1.1b	60.0	38.0	31.4	29.8	-	sic1
24-36	B22	-	0.3b	0.2b	0.3b	2.1b	61.1	36.0	36.1	27.3	-	sic1
36-48	B3	-	0.1b	0.2b	0.3b	2.6b	62.6	34.2	38.2	27.2	-	sic1
48-60	C	-	0.1b	0.1b	0.2b	3.0b	65.1	31.5	42.4	25.8	-	sic1

DEPTH INCHES	pH	ORGANIC MATTER			ESTIM. SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	MOISTURE TENSIONS				
		6A1a	6B1a	C/N			6E1a	4B2			
		1:5	1:10	ORGANIC CARBON %	NITROGEN %		CaCO ₃ equiv. amt %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
5.8				2.14	.193	11.1					12.6
6.1				2.11	.188	11.2					14.0
6.5				1.47	.136	10.8					15.4
6.6				0.91	.088	10.3					15.3
6.7				0.48							10.4
6.7				0.26							10.2
6.8				0.18							13.2

DEPTH INCHES	5A1a	EXTRACTABLE CATIONS 5B1a					BASE SAT. NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a Sum Bases	5A3a Sum Cations	Vol. Wt. g/cc
		6N2b	6O2b	6H1a	6P2a	6Q2a					
		Ca	Mg	H	Na	K					
		milliequivalents per 100g. soil					5C1	5C3	me./100 g.		4A3a
24.1		13.6	5.2	10.9	-	1.5	84	65	20.3	31.2	
25.1		14.9	5.6	9.9	-	0.8	85	68	21.3	31.2	1.28
26.1		15.8	6.5	7.9	-	0.5	87	74	22.8	30.7	
29.0		17.9	8.1	6.7	-	0.5	91	80	26.5	33.2	
28.4		18.0	7.9	5.9	0.1	0.4	93	82	26.4	32.3	1.46
28.2		18.1	7.9	6.1	0.1	0.5	94	81	26.6	32.7	
26.7		17.6	7.5	5.2	0.2	0.5	97	83	25.8	31.0	1.30

a. Organic matter.
 b. Many smooth brown porous concr. (Fe?).

Soil type: Sharpsburg silt loam
 Soil No.: S57Nebr-89-4-(1-7)
 Location: 350 feet north and 100 feet west of southeast corner of southwest quarter Sec. 28, T19N, R10W, Washington County, Nebraska.
 Physiography: Nearly level loess plain.
 Relief: 2 to 6 feet.
 Slope: Level, less than 1 percent.
 Parent material: Feorian loess.
 Drainage: Moderately well.
 Permeability: Moderately slow.
 Land use: Cultivated, wheat 1957.

Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

- A_{1p} 6278 0 to 5 inches. Very dark brown (10YR 2/2 moist) to dark grayish brown (10YR 4/1.5 dry) heavy silt loam; weak subangular blocky clods breaking to moderate very fine granules; friable, moist; slightly hard, dry; abundant roots; no effervescence; abrupt smooth boundary.
- A₁₂ 6279 5 to 12 inches. Very dark brown (10YR 2/1.5 moist) to dark grayish brown (10YR 3.5/2 dry) light silty clay loam which crushes to 10YR 3/3 moist. Moderate fine granular; friable, moist; slightly hard, dry; abundant roots; many very fine pores and numerous worm casts; an occasional 1/8-inch iron-manganese shot-like concretion; no effervescence; clear smooth boundary.
- B₁ 6280 12 to 16 inches. Very dark grayish brown (10YR 3/2 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam which crushes to dark brown (10YR 3/3 moist); weak medium subangular blocky breaking to moderate fine granular; patchy coating on aggregates; roots plentiful, few worm casts; no effervescence; few 1/16- to 1/8-inch very dark brown shot-like concretions; clear smooth boundary.
- B₂₁ 6281 16 to 24 inches. Very dark brown (10YR 3.5/3 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam crushing to 10YR 4/3, moist; weak medium subangular blocky breaking to moderate fine granular; slightly firm, moist; hard, dry; roots plentiful, few very fine pores; an occasional 1/16-inch very dark brown shot-like concretion; no effervescence; clear smooth boundary.
- B₂₂ 6282 24 to 36 inches. Dark grayish brown (10YR 4/2.5 moist) to grayish brown (10YR 5/2.5 dry) silty clay loam; weak coarse prismatic breaking to moderate fine subangular blocky; slightly firm, moist; hard, dry; aggregate coatings thin and continuous; some dark-colored thick coatings on faces of prisms; roots common but tend to follow faces of subangular blocks; few faint fine yellowish brown mottles; no effervescence; gradual smooth boundary.
- B₃ 6283 36 to 48 inches. Dark grayish brown (2.5Y 4/2 moist) to grayish brown (2.5Y 5.5/2 dry) silty clay loam. Weak coarse prismatic breaking to weak medium and fine subangular blocky; friable, moist; slightly hard, dry; few roots, many fine and very fine pores; common distinct fine yellowish brown mottles; a few prominent very dark brown soft iron-manganese concretions; no effervescence; gradual smooth boundary.
- C 6284 48 to 60 inches. Grayish brown (2.5Y 5/2.5 moist) to grayish brown (2.5Y 5.5/2 dry) silty clay loam. Weak coarse prismatic breaking to weak subangular blocks; very friable, moist; soft, dry; numerous fine and very fine pores; common distinct fine yellowish brown mottles; a few fine prominent very dark brown soft iron-manganese concretions; no roots; no effervescence.

Horizons A₁₂, B₂₂ and C sampled for Bureau of Public Roads.

OIL TYPE Sharpsburg LOCATION Washington County, Nebraska
silt loam

SOIL NOS. S57Nebr-89-6-(1-7) LAB. NOS. 6292-6298

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per conv) 3A1										TEXTURAL CLASS		
		1B1a		COARSE SAND		MEDIUM SAND		FINE SAND		VERY FINE SAND			2A2	
		2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	> 2			
0-6	Alp	-	0.1	0.1a	0.1a	1.7a	66.5	31.5	40.9	27.4	-	sicl		
6-12	Al2	0.1	0.1	-	-	1.6a	65.4	32.8	40.8	26.2	-	sicl		
12-17	A3	-	-	0.2b	0.2b	1.3b	63.2	35.1	37.0	27.6	-	sicl		
17-25	B21	0.1	0.2	0.1b	0.2b	1.1b	61.0	37.3	34.6	27.6	-	sicl		
25-36	B22	-	-	0.1b	0.2b	2.3b	61.4	36.0	38.6	25.2	-	sicl		
36-45	B3	-	-	0.1b	0.2b	3.2b	63.9	32.6	42.3	24.9	-	sicl		
45-60	C	-	0.1	0.1b	0.3b	3.6b	63.7	32.2	44.0	23.5	-	sicl		
8C1a		pH		ORGANIC MATTER			EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	6E1a			MOISTURE TENSIONS		
1:1		1:5	1:10	6A1a	6B1a	C/N			CoCO ₃ equiv-alent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	4B2
5.8				%	%								12.9	
5.9				2.11	.176	12.0							13.6	
6.1				2.21	.181	12.2							16.0	
6.1				1.91	.164	11.6							15.9	
6.3				1.27	.112	11.3							15.6	
6.5				0.51									14.9	
6.6				0.29									14.6	
				0.19										
5A1a		EXTRACTABLE CATIONS 5B1a					BASE SAT. % NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a	5A3a	4A3a			
CATION EXCHANGE CAPACITY NH ₄ Ac	6M2b	6O2b	6H1a	6P2a	6Q2a	Sum Bases			Sum Cations	Vol. Wt. g/cc				
		Ca	Mg	H	Na	K	5C1		← me/100 g →					
24.4	13.5	4.5	11.0	-	1.4	80	64	19.4	30.4					
25.5	14.6	4.6	11.4	-	0.9	79	64	20.1	31.5	1.26				
26.0	15.3	5.4	10.3	-	0.6	82	67	21.3	31.6					
27.5	16.7	6.5	8.4	0.1	0.7	87	74	24.0	32.4					
27.6	17.6	7.5	6.4	0.1	0.6	93	80	25.8	32.2	1.42				
26.3	17.5	7.5	5.6	0.1	0.6	98	82	25.7	31.3					
25.5	17.8	6.9	4.8	0.2	0.5	100	84	25.4	30.2	1.37				
a.	Few irregular brown concr. (Fe-Mn?)													
b.	Many smooth brown concr. (Fe-Mn?)													

Soil type: Sharpsburg silt loam
 Soil No.: 857(Nebr-89-6-(1-7))
 Location: 800 feet west and 75 feet north of center of Sec. 3, T17N, R10E, Washington County, Nebraska.
 Physiography: Nearly level loess plain.
 Relief: 2 to 6 feet.
 Slope: Level, less than 1 percent.
 Parent material: Peorian loess.
 Drainage: Moderately well.
 Permeability: Moderately slow.
 Land use: Cultivated, oats 1957.

Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and
 Lincoln
 Lab. Number

- A1p 0 to 6 inches. Very dark brown (10YR 2/1.5 moist) to very dark gray (10YR 3.5/1.5 dry) heavy silt loam; moderate medium subangular blocky clods breaking to moderate fine granular; friable, moist; slightly hard, dry; no effervescence; abrupt smooth boundary.
- A12 6 to 12 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 2.5/2 dry) silty clay loam; upper 3 inches is a compacted plow pan, sharp-angled blocks and thick plates; the lower 3 inches is moderate medium and fine subangular blocky breaking to moderate fine and very fine granular; friable, moist; slightly hard, dry; abundant fine roots, numerous very fine pores, few worm casts; no effervescence; clear smooth boundary.
- A3 12 to 17 inches. Very dark brown (10YR 2/2 moist) to very dark grayish brown (10YR 3/2 dry), to 10YR 3/2 in lower part, silty clay loam; weak medium subangular blocky breaking to strong fine granular; friable, moist; slightly hard, dry; numerous fine and medium pores, numerous worm casts; no effervescence; crushes to 1/2 chip lighter and 1/2 chip browner; clear smooth boundary.
- B21 17 to 25 inches. Very dark grayish brown (10YR 3/2.5 moist) to dark grayish brown (10YR 4/2 dry) silty clay loam, crushing to 10YR 4/3, moist; weak coarse prismatic breaking to moderate fine subangular blocky; slightly firm, moist; hard, dry; abundant roots, numerous fine and medium pores; aggregates have thin nearly continuous coatings; no effervescence; clear smooth boundary.
- B22 25 to 36 inches. Dark brown (10YR 3/3 moist) to brown (10YR 5/3 dry) silty clay loam, crushing to 10YR 4.5/3, moist; weak medium prismatic breaking to moderate medium and fine subangular blocky; slightly firm, moist; hard, dry; thin continuous coatings on aggregates; abundant roots, few worm casts of darker materials; few faint fine yellowish brown mottles; no effervescence; gradual smooth boundary.
- B3 36 to 45 inches. Olive brown (2.5Y 4/3 moist) to brown (10YR 5/3 dry) silty clay loam, crushing to slightly lighter color; moderate medium and fine prismatic breaking to moderate fine subangular blocky; slightly firm, moist; hard, dry; patchy thin coatings on aggregates; a few very fine roots, numerous fine and medium pores; fine medium common distinct yellowish brown mottles; no effervescence; gradual smooth boundary.
- C 45 to 60 inches. Grayish brown (2.5Y 5/2 moist) to light brownish gray (2.5Y 5.5/2 dry) silty clay loam; weak coarse prismatic; very friable, moist; slightly hard, dry; many fine to medium pores, no roots; common distinct medium and fine yellowish brown mottles; few fine soft very dark brown iron-manganese concretions; no effervescence.

Note: Calcareous 65 to 84 inches; violent effervescence with few hard lime concretions. No effervescence 84 to 100 inches except in a few very fine pores and openings. Horizons A12, B22 and C sampled for Bureau of Public Roads.

SOIL TYPE Sharpsburg LOCATION Washington County, Nebraska
 silty clay loam

SOIL NOS. S57Nebr-89-7-(1-7) LAB. NOS. 6299-6305

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2		
0-6	Alp	0.1a	-	-	0.1b	3.6b	63.9	32.3	43.8	23.8	-	sic1	
6-9	Al2	-	-	-	0.1b	3.4b	61.8	34.7	39.3	26.0	-	sic1	
9-14	B1	-	-	-	-	3.5b	59.3	37.2	40.2	22.6	-	sic1	
14-20	B21	-	-	-	-	4.3b	59.3	36.4	42.0	21.6	-	sic1	
20-30	B22	-	-	-	0.1b	5.3b	61.4	33.2	47.9	18.9	-	sic1	
30-42	B23	-	-	-	0.1b	5.3b	62.3	32.3	45.1	22.6	-	sic1	
42-60	C	-	-	-	0.1b	5.2b	63.3	31.4	45.5	23.1	-	sic1	

pH	ORGANIC MATTER					ELECTRICAL CONDUCTIVITY EC · 10 ³ MILLIMHOS PER CM	6E1a		MOISTURE TENSIONS		
	8C1a	6A1a		6B1a	EST% SALT (BUREAU CUP)		CaCO ₃ equiv- alent	GYPSUM mg./100g. SOIL	1/10	1/3	15
		1:5	1:10	ORGANIC CARBON					NITRO-GEN	C/N	ATMOS.
5.7			2.01	.182	11.0						12.6
5.7			1.82	.167	10.9						13.9
6.0			1.45	.134	10.8						15.2
6.3			0.81	.080	10.1						15.0
6.5			0.50	.054	9.2						14.1
6.7			0.27								14.6
6.8			0.17								14.7

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. NH ₄ Ac EXCH.	Base Sat. % on Sum Cations	5B1a Sum Bases	5A3a Sum Cations	4A3a Vol. Wt. g/cc
	6N2b	6O2b	6H1a	6P2a	6Q2a					
	Ca	Mg	H	Na	K					
	← milliequivalents per 100g. soil →					5C1	5C3	← me/100 g →		
23.0	12.8	4.0	12.2	-	1.0	77	59	17.8	30.0	
24.6	13.9	4.8	11.5	-	0.7	79	63	19.4	30.9	
25.6	15.6	5.8	9.6	0.1	0.6	86	70	22.1	31.7	
25.5	16.1	7.0	7.6	0.1	0.6	93	76	23.8	31.4	
24.8	16.0	6.9	5.6	0.1	0.5	95	81	23.5	29.1	1.34
24.8	16.9	7.0	4.8	0.1	0.6	99	84	24.6	29.4	
25.4	17.5	6.5	4.0	0.2	0.6	98	86	24.8	28.8	1.34

a. Organic matter.
 b. Common smooth brown coner. (Fe-Mn?)

Soil type: Sharpsburg silty clay loam

Soil No.: S57Nebr-89-7-(1-7)

Location: 400 feet west and 100 feet south of northeast corner northwest quarter Sec. 3, T18N, R9E, Washington County, Nebraska.

Physiography: Ridge top in dissected loess plain.

Relief: 60 to 80 feet.

Slope: 1 percent, smooth slightly convex.

Parent material: Peorian loess.

Drainage: Well drained.

Permeability: Moderate.

Salt or alkali: Carbonates present at 120 plus inches as few fine soft white accumulations in pores and small openings.

Land use: Cultivated, wheat 1957.

Described by: J. A. Elder and H. L. Kollmorgen.

Horizon and

Lincoln

Lab. Number

- Alp 0 to 6 inches. Dark brown (10YR 2/1.5 moist) to very dark gray (10YR 4/1.5 dry) silty clay loam; weak subangular blocky clods breaking to moderate fine and very fine granular; friable, moist; slightly hard, dry; no effervescence; abrupt smooth boundary.
- 6299
- A12 6 to 9 inches. Dark brown (10YR 2/1.5 moist) to very dark grayish brown (10YR 3.5/2 dry) silty clay loam; moderate medium subangular blocky and weak medium platy in compacted plow layer; friable, moist; hard, dry; numerous worm casts, abundant roots; crushes to 10YR 4/3 moist; no effervescence; clear smooth boundary.
- 6300
- E1 9 to 14 inches. Very dark grayish brown (10YR 3/2.5 moist) to dark grayish brown (10YR 4/2.5 dry) silty clay loam crushing to 10YR 3.5/3, moist; moderate fine subangular blocky breaking to fine granular; friable, moist; hard, dry; abundant roots, numerous fine pores, few worm casts; no effervescence; clear smooth boundary.
- 6301
- E21 14 to 20 inches. Dark brown (10YR 3/3 moist) to dark brown (10YR 4.5/3 dry) silty clay loam crushing to 10YR 4/3, moist; weak medium prismatic breaking to moderate medium and fine subangular blocky; slightly firm, moist; hard, dry; thin continuous coatings on aggregates; numerous medium and fine pores, few worm casts, abundant roots; no effervescence; clear smooth boundary.
- 6302
- E22 20 to 30 inches. Dark brown (10YR 3.5/3 moist) to brown (10YR 5/3 dry) silty clay loam crushing to 10YR 4/3, moist; moderate medium and coarse prismatic breaking to moderate medium and fine subangular blocky; slightly firm, moist; hard, dry; thin continuous coatings on both large and small aggregates; abundant roots but most on faces of aggregates; a few fine soft very dark brown iron-manganese concretions; no effervescence; clear smooth boundary.
- 6303
- E23 30 to 42 inches. Dark grayish brown (10YR 4/2.5 moist) to brown (5/3 dry) silty clay loam crushing to 10YR 4/3 moist; moderate coarse prismatic breaking to weak medium subangular blocky; slightly firm, moist; hard, dry; thin coating on large aggregates, patchy thin coatings on smaller aggregates; common distinct fine yellowish brown mottles; abundant roots on faces of larger aggregates; no effervescence; clear smooth boundary.
- 6304
- C 42 to 60 inches. Grayish brown (10YR 4/2.5 moist) to brown (10YR 5/3 dry) silty clay loam; weak coarse prismatic; friable, moist; slightly hard, dry; common faint fine yellowish brown mottles, common distinct fine gray mottles and few very dark brown soft iron-manganese concretions; no effervescence.
- 6305

Horizons Alp, E22 and C sampled for Bureau of Public Roads.

1208-1214

SOIL SURVEY LABORATORY

SOIL TYPE Silver Creek silt loam

Mandan, North Dakota

SOIL NO. S52Nebr-10-1-(1-7)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
			1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	2A2 > 2			
1208	0-5	Alp	0.2	0.3	0.5	1.3	11.8	59.2	26.7	15.9	56.0	---	sil
1209	5-10	Al2	0.1	0.3	0.4	1.2	10.5	57.8	29.7	16.7	52.4	---	sic1
1210	10-15	B1	0.6	0.7	0.7	2.1	6.5	41.1	48.3	17.5	31.6	---	sic
1211	15-28	B21ca	1.0	1.4	1.4	4.4	7.9	41.2	42.7	17.3	35.0	---	sic
1212	28-37	B22	0.7	0.8	1.0	3.5	11.1	48.5	34.4	18.4	43.8	---	sic1
1213	37-45	Cg	0.1	1.1	2.0	7.4	13.5	36.4	39.5	15.4	39.7	---	cl
1214	45-52	D1	0.9	2.4	3.1	18.9	23.4	39.1	12.2	17.5	60.0	---	1
pH			ORGANIC MATTER				8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCT- IVITY EC x 10 ⁵ MILLIMHOS PER CM	CaCO ₃ equivalent per cent	GYPSUM me./100g SOIL	MOISTURE TENSIONS (per cent)		
SATURATED PASTE		1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N	8A1a	6F1a	6F1a	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	4F2
8C1b	8C1a	8C1a	6A1a										
6.7	7.5	7.7	2.34				---	0.7	tr	---			14.4
7.2	8.2	8.4	2.24				---	0.7	tr	---			16.8
8.0	8.5	8.8	1.46				---	0.8	2	---			26.2
7.9	8.6	8.9	0.87				0.27	4.2	4	---			22.1
7.7	8.4	8.6	0.57				0.27	4.8	3	---			19.2
7.8	8.3	8.6	1.05				0.25	4.1	17	4			20.6
4.8	5.4	5.6	0.30				---	3.2	---	---			7.3
5A1a CATION EXCHANGE CAPACITY N/100C	5B1a EXTRACTABLE	CATIONS				5B1b EXCHANGEABLE	5D2 EXCHANGE- ABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1					8A PER CENT MOISTURE AT SATURATION
	Ca 6N2b	Mg 6O2b	Na 6P2a	K 6Q2a			6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄	
	milliequivalents per 100g soil						milliequivalents per liter						
26.7	17.3	6.9	0.7	2.0	3	4.1	0.9						50.8
28.8	18.4	7.6	1.8	1.8	6	5.2	0.5						57.0
36.5			3.9	1.5	11	7.2	---						93.6
31.0			4.1	1.2	13	30.9	0.5						88.4
26.2			3.5	1.0	13	33.5	0.8						81.7
22.8			1.7	0.8	7	28.3	0.5						83.8
12.5	6.3	2.3	1.5	0.5	12	25.2	0.5						40.7

Soil Type: Silver Creek silt loam
 Soil No.: S52Nebr-10-1-(1-8)
 Date: September 1952
 County: Buffalo County, Nebraska.
 Location: Fifty feet east of W1/4 corner Sec. 23, T9N, R13W.
 Described by: B. H. Williams.

Lab. No.	Horizon	Description
1208	Alp	0-5 inches. Very dark gray (10YR 3/1 moist) to dark gray (10YR 4/1 dry) fine granular silt loam; no free lime.
1209	A12	5-10 inches. Very dark gray (10YR 3/1 moist) to dark gray (10YR 4/1 dry) heavy silt loam or silty clay loam; macro blocky breakage but with moderate pressure breaks to medium and coarse granules; slightly calcareous with a few fine white spots of free lime carbonate.
1210	B1	10-15 inches. Black (10YR 2/1 moist) to dark gray (10YR 4/1 dry) silty clay; macro blocky, breaking easily to medium blocks and these in turn into coarse subangular granules; fairly abundant soft lime spots and seams; otherwise not appreciably calcareous.
1211	B21ca	15-28 inches. Very dark brown (10YR 2/2 moist) to gray (10YR 4.5/1 dry) silty clay; coarse blocky primary and fine subangular blocky-coarse granular secondary structure; calcareous including a great abundance of spots and streaks of free lime carbonate. When moderately moist the structure particles fall apart with only slight pressure; when wet the soil is sticky and plastic and hard when dry.
1212	B22	28-37 inches. Dark gray (10YR 4/1 moist) to gray (10YR 5/1 dry) heavy silty clay loam or silty clay medium blocky with some natural breakage to smaller blocks; consistence about as in horizon above and lime accumulation not so pronounced.
1213	Cg	37-45 inches. Gray and light gray marbled silty clay loam (moist) with some grayish brown seams and streaks and olive yellow and olive brown mottles; soft plastic and sticky at near saturated moisture condition when sampled; calcareous including some free lime spots and fairly abundant snail shells.
1214	D1	45-52 inches. Grayish brown (2.5Y 5/2 moist) to light gray (2.5Y 7/2 dry) fine sandy loam; massive; slightly sticky, wet; slightly calcareous. Numerous fine, some coarse, mottles; mainly yellow and yellowish brown colors.
--	D2	52-60+ inches. Loose coarse sand containing some fine gravel; basic color light gray; some fine brown and yellowish brown mottles; concentric mottles or staining around root channels, some of which are 1/4 inch in diameter and continuous through the depth of the horizon samples; no free lime carbonate; horizon below water table, in nonirrigated corn field.

Note: Collected from low terrace where soils were mapped Lamoure in the published Buffalo County Soil Survey Series 1924. The soil seems to fall within the range of Silver Creek soils first described and sampled in Hall County at a higher terrace level but in flat or slightly depressed areas. The lime carbonate horizon does not show quite as heavy lime concentration as in the soils of Hall County and there seems to be a little better blocky structure development in the Buffalo County soils of this kind in the general area of this sample location.

SOIL SURVEY LABORATORY
Mandan, North Dakota

SOIL TYPE Silver Creek silt loam

SOIL NO. S52Nebr-10-2-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
			1B1a		3A1						2A2			
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.075 (<9mm)	> 2		
1215	0-5	A1p	0.1	0.3	0.6	1.8	16.4	60.4	20.4	14.3	63.7	-	sil	
1216	5-9	A12	0.2	0.3	0.8	2.4	13.9	51.4	31.0	13.3	53.6	-	sic1	
1217	9-13	B1	0.2	0.5	0.9	2.5	12.0	44.5	39.4	12.3	45.8	-	sic1	
1218	13-19	B21	0.1	0.5	0.8	2.5	10.5	43.7	41.9	12.7	43.2	-	sic	
1219	19-30	B22	0.7	0.8	1.2	4.1	11.8	42.8	38.6	15.5	41.8	Tr.	sic1	
1220	30-34	A1b	0.1	1.0	2.2	8.5	18.0	45.2	25.0	13.5	55.5	-	1	
1221	34-46	B1b	0.3	1.6	3.1	15.9	22.1	34.7	22.3	11.6	56.0	Tr.	1	
1222	46-51	B3gb	-	0.3	1.0	15.7	33.2	32.8	17.0	13.1	66.7	-	1	
1223	51-56	Cgb	0.1	0.5	1.9	26.6	46.3	17.0	7.6	5.8	79.5	-	vfsl	
pH			ORGANIC MATTER			8A0 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	CaCO ₃ equivalent per cent	GYPSUM me./100g SOIL	MOISTURE TENSIONS (per cent) ATMOS.				
SATURATED PASTE		1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N	6A1a	6E1a	6F1a	1/10	1/3	15	4E2	
8C1b	8C1a	8C1a	6A1a											
8.0	8.9	9.1	1.53				-	1.0	2				11.0	
8.2	9.2	9.4	1.16				-	1.1	3				15.5	
8.3	9.1	9.2	0.86				-	1.1	17				17.8	
8.7	9.6	9.7	0.50				-	1.1	22				19.1	
8.8	9.8	9.9	0.31				-	1.3	23				17.7	
8.8	9.8	9.9	0.16				-	1.3	1				17.7	
8.8	9.7	9.9	0.12				-	1.4	10				16.3	
8.1	8.0	9.0	0.11				-	1.5	1				11.8	
5.4	5.5	5.7	0.31				-	4.0	1				6.5	
5A1a CATION EXCHANGE CAPACITY		5B1a CATIONS EXTRACTABLE				5B1b EXCHANGEABLE	5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1					8A PER CENT MOISTURE AT SATURATION	
Ca		Mg 602b		Na 6P2a	K 6Q2a		6P1b Na	6Q1a K	CO ₂	HCO ₃	Cl	SO ₄		
milliequivalents per 100g soil							milliequivalents per liter							
18.1			0.6	1.8	3	5.2	0.9						54.5	
19.7			2.2	1.8	11	8.3	0.5						71.6	
17.8			2.2	1.6	12	9.1	0.5						82.3	
16.8			3.0	1.7	18	10.2	0.2						103.4	
15.2			4.7	2.0	31	11.7	0.2						106.2	
19.0		9.3	6.9	2.5	36	12.8	0.2						103.0	
17.0			6.1	1.9	36	13.9	0.2						84.5	
15.3		5.4	5.3	1.5	35	14.3	0.2						64.1	
9.3		3.1	2.0	0.8	22	35.6	1.3						43.8	

Soil Type: Silver Creek silt loam
 Soil No.: 852Nebr-10-2-(1-10)
 Date: September 1952
 County: Buffalo County, Nebraska.
 Location: One-fourth mile west and 60 feet north of SE corner Sec. 24, T9N, R14W.
 Described by: B. H. Williams.

Mandan

Lab.No.	Horizon	Description
1215	A1p	0-5 inches. Dark gray (10YR 3.5/1 moist) to gray (10YR 5/1 dry) friable, granular silt loam; lime free in general but effervesces weakly with dilute HCl in parts of the field sampled.
1216	A12	5-9 inches. Very dark brown (10YR 2/2 moist) to gray (10YR 4.5/1 dry) granular heavy silt loam; slightly calcareous in lower part.
1217	B1	9-13 inches. Dark gray (10YR 4/1 moist) to gray (10YR 5/1 dry) blocky granular silty clay loam; friable, moist; sticky when wet; moderately hard when dry; slightly calcareous.
1218	B21	13-19 inches. Dark gray or dark grayish brown (10YR 4/1.5 moist) to gray (10YR 5/1 dry) blocky silty clay loam; friable, moist; moderately to strongly calcareous.
1219	B22	19-30 inches. Grayish brown (2.5Y 5/2 moist) to light gray (2.5Y 7/2 dry) weak blocky, friable, silty clay loam; very strongly calcareous, mainly disseminated lime; some concretions especially in the lower 2 inches where also there are numerous snail shells present.
1220	A1b	30-34 inches. Dark gray (2.5Y 4/1 moist) to light brownish gray (2.5Y 6/2 dry) silty clay; moderately compact, no well-defined structure except widely spaced horizontal cleavage planes that are stained with pale brown and partly coated with free lime carbonate; the horizon is not otherwise appreciably calcareous; sticky and plastic, moist. This is a weakly developed A of a buried soil or a dark sedimentary layer.
1221	B1b	34-46 inches. Dark gray (5Y 4.5/1 moist) to light olive gray (5Y 6/2 dry) sandy clay loam or sandy clay; aside from slightly lighter color, more fine sand and faint mottles, this layer does not appear different from the one next above; free lime mainly along structure planes.
1222	B3gb	46-51 inches. Light olive gray or pale olive (5Y 6/2.5 moist) to light gray (5Y 7/2 dry) loam. Aside from lighter color and coarser texture not appreciably different from the two horizons next above.
1223	Cgb	51-56 inches. Olive gray (5Y 5/2 moist) to light gray (5Y 7/2 dry) sticky sandy loam; massive except vertical cleavage; abundant mottlings staining, especially along root channels; no free lime.
--	D	56-60 inches. Medium and fine loose gray sand; rests on the water table in coarse sand.

SOIL SURVEY LABORATORY

SOIL TYPE Silver Creek silt loam

Mandan, North Dakota

SOIL NO. S51Nebr-40-9-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS				
			1B1a		3A1						2A2						
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02	> 2 (<19mm)					
933	0-7	A1p	0.4	0.6	0.9	3.1	19.7	56.3	19.0	15.2	62.6	-	sil				
934	7-12	A12	0.4	0.6	0.8	2.8	19.3	55.3	20.8	16.4	60.2	-	sil				
935	12-17	B21	0.5	0.5	0.5	1.2	11.0	39.9	46.4	12.4	39.2	-	c				
936	17-22	B22	1.3	0.8	0.6	1.2	9.6	41.8	44.7	14.2	37.9	2a	sic				
937	22-30	B3	3.7	0.8	2.1	1.5	9.4	46.0	36.5	17.1	39.2	2a	sic1				
938	30-40	C1	7.7	2.2	1.0	1.8	10.8	49.9	26.6	20.4	41.4	2a	1				
939	40-55	C2	1.9	1.2	0.7	1.0	15.9	56.6	22.7	22.9	50.1	8a	sil				
940	55-60	C3	0.5	0.5	0.4	1.0	18.4	57.8	21.4	22.7	54.1	6a	sil				
			pH			ORGANIC MATTER			8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equivalent per cent	GYPSUM me./100g SOIL	MOISTURE TENSIONS (per cent) ATMOS.				
			SATURATED PASTE 8C1b	1:5 8C1a	1:10 8C1a	% ORGANIC CARBON 6A1a	% NITROGEN	C/N					1/10	1/3	15		
			6.9	7.3	7.4	2.38			-	1.8	-	-			8.9		
			8.5	9.3	9.6	1.13			-	1.4	2	-			9.8		
			8.7	9.5	9.5	0.80			-	1.6	2	-			23.8		
			8.9	9.3	9.5	0.62			-	2.1	8	-			25.3		
			8.5	9.2	9.6	0.32			-	3.5	18	-			17.5		
			8.1	9.0	9.2	0.19			-	3.2	18	-			14.2		
			7.9	8.7	9.0	0.09			-	2.8	13	-			12.3		
			7.8	8.6	9.0	0.07			-	1.2	8	-			11.2		
			5A1a CATION			5B1a CATIONS		5B1b	5D1	SATURATION EXTRACT SOLUBLE 8A1					8A PER CENT MOISTURE AT SATURATION		
			EXTRACTABLE		EXCHANGEABLE				6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄			
			Ca 6N2b	Mg 6O2b	Na 6P2a	K 6Q2a	EXCHANGEABLE SODIUM PERCENTAGE ESP										
			milliequivalents per 100g soil														
			21.3	10.8	8.4	0.3	3.3	1	0.9	4.7					58.4		
			17.0			1.1	5.7	6	6.7	4.7				50.4			
			30.8			5.4	12.3	18	13.7	2.9				84.9			
			29.2			7.3	9.8	25	24.6	2.7				116.5			
			22.7			4.2	5.0	18	33.0	2.9				88.7			
			20.1			2.5	3.0	12	23.7	2.4				63.0			
			20.8			1.5	2.3	7	1.3	1.8				52.3			
			21.3			0.7	2.0	3	4.8	0.9				48.5			
			a. Largely calcareous concretions.														

Soil type: Silver Creek silt loam

Soil No.: S51Nebr-40-9-(1-8)

Location: About 850 feet west of SW¹/₄ corner, (SE¹/₄ SW¹/₄), Sec. 34, T12N, R11W, Hall County, Nebraska.

Vegetation: Nonirrigated corn; will probably yield 25-35 bushels per acre.

Parent material: Loess.

Physiographic position: This soil occupies a slightly higher terrace position than the Exline silt loam with which it is associated. According to local information the sand and gravel is not encountered until around 15-18 feet. The area however, is one in which the ground water is encountered at $4\frac{1}{2}$ to 6 or 7 feet.

Topography: Level plain.

Slope: Less than 1 percent.

Drainage: Medium slow.

Erosion: None or slight.

Moisture: Moist.

Stoniness: None.

Described by: B. H. Williams.

Date: October 9, 1951.

Mandan

Lab. No.	Horizon	Description
933	A1p	0-7 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam (but with considerable very fine sand present) granular, friable; noncalcareous although in numerous places checked in field, the surface soil was calcareous.
934	A12	7-12 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam soft granular, friable; moderately calcareous.
935	B21	12-17 inches. Dark gray (10YR 4/1 dry) to weak dark gray (10YR 3/1 moist) silty clay; angular blocky, sticky when moist and hard when dry; matrix is noncalcareous for the most part, but free lime segregations are common.
936	B22	17-22 inches. Grayish brown (2.5Y 5/2 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay; angular blocky; very sticky and plastic when wet; hard when dry; calcareous, lime concretions larger and more numerous than in horizon above.
937	B3	22-30 inches. Light gray (2.5Y 7/2 dry) to light brownish gray (2.5Y 6/2 moist). Heavy silty clay loam; slightly darker in upper part; subangular blocky; firm when moist and hard when dry; strongly calcareous with abundance of free lime present; a few soft lime concretions; grades to horizon beneath.
938	C1	30-40 inches. White (5Y 8/2 dry) to light olive gray (5Y 6/2 moist) silty clay loam, subangular blocky; firm when moist and hard when dry; strongly calcareous; horizon of maximum lime accumulation; a few yellow mottlings in lower part.
939	C2	40-55 inches. Light gray (5Y 7/2 dry) to olive gray (5Y 6/2.5 moist) silt loam; weak subangular blocky; friable; slightly hard when dry; strongly calcareous; soft and hard lime concretions present; yellowish mottlings few, but distinct and coarse.
940	C3	55-60 inches. Light gray (5Y 7/2.5 dry) to light olive gray (5Y 6/2.5 moist) silt loam; massive; friable when moist and only slightly hard when dry; strongly calcareous with soft and hard lime concretions present; yellowish mottlings smaller and not as numerous as in above horizon; a few black or very dark brown (manganese?) flecks present.

SOIL Thurman sandy loam SOIL Nos. 960Nebr-2-1 LOCATION Antelope County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 13472-13477 December 1964

Depth (In.)	Horizon	1A1a Size class and particle diameter (mm) 3A1											Coarse fragments			
		Total			Sand				Silt				2A2	2A2	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)	(2-0.1)	> 2 Pct	2-19 Pct	19-76 Pct
Pct. of < 2 mm																
0-7	A1p	88.0	7.1	4.9	2.0	10.8	21.8	45.3	8.1	4.2	2.9	30.5	79.9	-	-	-
7-12	A12	81.4	10.0	8.6	1.1	7.0	16.7	43.0	13.6	6.6	3.4	39.8	67.8	-	-	-
12-16	AC	82.5	8.6	8.9	0.6	6.8	16.2	44.5	14.4	6.3	2.3	41.9	68.1	-	-	-
16-23	C1	86.1	6.1	7.8	0.6	7.4	21.0	46.7	10.4	3.9	2.2	34.3	75.7	-	-	-
23-44	C2	90.2	4.8	5.0	0.8	8.3	24.0	49.1	8.0	2.9	1.9	30.2	82.2	tr.	tr.	-
44-60	C3	89.8	4.8	5.4	1.0	11.0	26.1	42.9	8.8	3.0	1.8	28.9	81.0	tr.	tr.	-
Depth (In.)	6A1a	6B1a	C/N	6E1c Carbonate as CaCO ₃	6C1a Ext. Iron as Fe ₂ O ₃ Pct.	Bulk density			Water content			pH		8C1a (1.1) H ₂ O		
	Organic carbon Pct	Nitrogen Pct.				4A1a Field-State g/cc	5A1a g/cc	6A1a g/cc	4B1a Field-State Pct.	4E1a 1/10 Bar Pct	4E2 15-Bar Pct.	8B1a	8C1a			
0-7	0.47	0.051	9		0.2										6.2	
7-12	0.52	0.054	10		0.3	1.72				11.0	11.6				5.8	
12-16	0.41	0.046	9		0.3										6.0	
16-23	0.29	0.032	9		0.3										6.1	
23-44	0.13	0.017			0.2						6.8				6.5	
44-60	0.06				0.2										6.6	
Depth (In.)	Extractable bases 5B1a					Ext. Acid-ity	Cat. Exch. Cap.				Base saturation					
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum Cat-ions	5A1a NH ₄ OAc	Sum Pct.	5C3 Cat-ions Pct.	5C1 NH ₄ OAc CEC Pct.					
0-7	2.7	0.5	tr.	0.7	3.9	2.0	5.9	4.6			66	85				
7-12	4.1	0.7	tr.	0.8	5.6	3.2	8.8	6.7			64	84				
12-16	4.9	0.7	tr.	0.2	5.8	2.2	8.0	6.7			72	86				
16-23	4.4	0.8	tr.	0.2	5.4	1.8	7.2	5.9			75	92				
23-44	2.5	0.9	tr.	0.1	3.5	1.5	5.0	3.8			70	92				
44-60	2.7	0.9	tr.	0.1	3.7	2.5	6.2	3.9			60	95				
Depth (In.)	Ratios to Clay 5D1			5-Bar water												
	NH ₄ OAc CEC															
0-7	0.94			0.5												
7-12	0.78			0.4												
12-16	0.75			0.4												
16-23	0.76			0.5												
23-44				0.5												
44-60	0.72			0.4												

Soil type: Thurman sandy loam
 Soil No.: 860Ebr-2-1
 Location: 375 feet west and 250 feet south of northeast corner, Sec. 34, T28N, R6W, Antelope County, Nebraska.
 Physiography: Undulating to low hummocky sandy area.
 Slope: 3 percent; east to southeast slope sampled.
 Parent material: Eolian sand.
 Drainage: Good.
 Permeability: Moderately rapid.
 Land use: Corn, in 1960.
 Described by: Herbert L. Kollmorgen and John Elder, June 1960.

Horizon and
 Lincoln

Lab. Number

Alp 13472	0 to 7 inches. Very dark grayish brown (10YR 3/2 moist) sandy loam; single grained; loose moist; abrupt smooth boundary.
A12 13473	7 to 12 inches. Very dark grayish brown (10YR 3/2 moist) fine sandy loam; weak coarse subangular blocky breaking to massive structure; very friable moist; clear smooth boundary.
AC 13474	12 to 16 inches. Dark grayish brown to very dark grayish brown (10YR 3.5/2 moist) fine sandy loam; weak coarse subangular blocky breaking to massive structure; very friable moist; gradual wavy boundary.
C1 13475	16 to 23 inches. Dark grayish brown (10YR 4/2 moist) loamy sand; single grain; loose moist; gradual wavy boundary.
C2 13476	23 to 44 inches. Dark grayish brown to brown (10YR 4/2.5 moist) loamy sand; single grain structure; loose moist; gradual wavy boundary.
C3 13477	44 to 60 inches. Brown (10YR 5/3 moist) fine sand; single grain structure; loose moist.

SOIL Thurman sandy loam

SOIL Nos. 859Nebr-26-4

LOCATION Dixon County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska

LAB. Nos. 12397-12404

December 1964

Depth (in.)	Horizon	1B1a											3A1										
		Total				Sand							Silt				Clay			Coarse fragments			
		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)	2A2 > 2	2A2 2-19	19-76							
0-5	A1p	78.9	15.2	5.9	1.5	18.0	26.5	28.5	4.4	9.8	5.4	21.6	74.5	-	-	-							
5-14	A12	78.8	13.0	8.2	1.2	17.7	27.4	29.7	2.8	8.7	4.3	20.2	76.0	-	-	-							
14-21	A3	83.4	10.3	6.3	1.0	17.1	27.0	34.8	3.5	6.1	4.2	20.8	79.9	-	-	-							
21-30	AC	88.5	6.1	5.4	1.0	16.7	29.4	38.1	3.3	4.3	1.8	19.6	85.2	-	-	-							
30-36	G1	84.9	9.5	5.6	1.1	12.2	25.0	41.1	5.5	6.0	3.5	26.5	79.4	tr.	tr.	-							
36-41	G2	81.2	11.9	6.9	7.2	14.3	19.3	34.7	5.7	8.5	3.4	27.0	75.5	tr.	tr.	-							
41-52	C3	92.6	3.1	4.3	10.6	22.3	21.1	32.7	5.9	2.2	0.9	21.3	86.7	tr.	tr.	-							
52-66	G4	95.6	1.8	2.6	1.5	21.9	30.1	38.1	4.0	1.3	0.5	17.9	91.6	-	-	-							

Depth (in.)	6A1a			6B1a			6C1a			6C1a			Bulk density					Water content					pH	
	Organic carbon	Nitrogen	C/N	Carbonate as CaCO ₃	Ext. Iron as Fe ₂ O ₃	4A1a Field-State	4A1a g/cc	4B1a g/cc	4B1a g/cc	4B1a Field-State	4B1a 1/10-Bar	4B1a 1/3-Bar	4B1a 15-Bar	4B2	8C1a (1)	8C1a H ₂ O								
0-5	0.73	0.075	10	tr.	0.4	1.61			10.2	14.9	7.7	3.8				7.0								
5-14	0.74	0.061	12		0.4					9.4	5.4	2.3				6.2								
14-21	0.32	0.038	8		0.4					7.2	3.9	1.7				6.4								
21-30	0.23	0.023			0.3	1.66			12.5	7.8	4.0	2.2				6.4								
30-36	0.16				0.3					10.6	5.7	3.0				6.5								
36-41	0.16				0.4					3.4	2.0	1.4				6.5								
41-52	0.06				0.3					2.7	1.7	0.8				6.6								
52-66	0.02				0.2											6.7								

Depth (in.)	Extractable bases 5B1a				6B1a			Cat. Exch. Cap.		8D3		Base saturation	
	6B2b Ca	6B2b Mg	6P2a Na	6Q2a K	Sum	Ext. Acidity	5A3a Sum Cations	5A1a NH ₄ OAc	Ca/Mg	5C3 Sum Cations	5C1 NH ₄ OAc		
0-5	6.4	1.0	tr.	0.4	7.8	1.4	9.2	6.9		6.4	85	113	
5-14	5.7	1.2	tr.	0.2	7.1	2.8	9.9	7.8		4.8	72	91	
14-21	3.9	1.0	tr.	0.1	5.0	1.6	6.6	5.2		3.9	76	96	
21-30	2.7	0.8	tr.	0.1	3.6	1.6	5.2	3.9			69	92	
30-36	3.0	1.0	tr.	0.1	4.1	1.4	5.5	4.4		3.0	74	93	
36-41	3.7	1.1	tr.	0.2	5.0	1.4	6.4	5.4		3.4	78	92	
41-52	2.0	0.9	tr.	0.1	3.0	0.9	3.9	2.8			77	107	
52-66	1.4	0.5	tr.	0.1	2.0	0.9	2.9	2.2			69	91	

Depth (in.)	Ratios to Clay 8M1	
	NH ₄ OAc CEC	15-Bar Water
0-5	1.17	0.4
5-14	0.95	0.5
14-21	0.82	0.4
21-30	0.72	0.4
30-36	0.78	0.3
36-41	0.78	0.4
41-52	0.65	0.3
52-66	0.85	0.3

a. One or more horizons has relatively low cation exchange capacity. As cation exchange capacity decreases, the relative error of base saturation increases. Trace quantities are omitted from the sum of bases. For very low CEC values, this omission contributes significantly to the relative error of base saturation.

Soil type: Thurman sandy loam

Soil No.: 859Nebr-26-4

Location: 850 feet north and 200 feet east of west 1/4 corner, Sec. 27, T27N, R5E, Dixon County, Nebraska; one mile north and one mile east of Wakefield, Nebraska. (Pete Oberg farm.)

Physiography: Gently rolling transition sand-loess hills area. (Usually deep sand over Peorian loess.)

Relief: B slopes; single convex slopes.

Slope: 3 to 4 percent southwest.

Parent material: Eolian sand.

Drainage: Well drained.

Permeability: Moderately rapid.

Land use: Cultivated; in corn.

Described by: Herbert L. Kollmorgen and John Elder, November 3, 1959.

Horizon and
Lincoln
Lab. Number

Alp 12397	0 to 5 inches. Very dark brown (10YR 2/2 moist) sandy loam; weak medium and fine crumb breaking to single grained; very friable moist; no effervescence; abrupt smooth boundary.
A12 12398	5 to 14 inches. Very dark brown (10YR 2/2 moist) sandy loam; weak coarse and medium subangular blocky to weak fine and very fine crumb; very friable moist; no effervescence; clear smooth boundary.
A3 12399	14 to 21 inches. Very dark grayish-brown (10YR 3/2 moist) sandy loam; weak medium and fine subangular blocky breaking to single grained; very friable moist; no effervescence; gradual smooth lower boundary.
AC 12400	21 to 30 inches. Very dark grayish-brown to dark brown (10YR 3.5/3 moist) sandy loam; weak medium and fine subangular blocky to single grained; loose moist; no effervescence; gradual smooth lower boundary.
C1 12401	30 to 36 inches. Dark brown (10YR 4/3 moist) sandy loam; weak medium and fine subangular blocky to single grained; very friable moist; no effervescence; gradual smooth lower boundary.
C2 12402	36 to 41 inches. Dark yellowish-brown (10YR 4/4 moist) sandy loam; weak medium and fine subangular blocky to single grained; very friable moist; no effervescence; clear smooth lower boundary.
C3 12403	41 to 52 inches. Yellowish-brown (10YR 5/4 moist) coarse sand; contains a small amount of very fine gravel; single grained; loose moist; no effervescence; gradual smooth lower boundary.
C4 12404	52 to 66 inches. Brown (10YR 5/3 moist) sand; single grained; loose.

Deeper borings below the pit sampled showed the following:

66 to 92 inches. Brown to pale brown (10YR 5.5/3 moist) sand; loose.

92 to 96 inches. Brown (10YR 5/3 moist) sand; common fine distinct yellowish-brown iron stains; loose.

96 to 101 inches. Yellowish-brown (10YR 5/4 moist) sand; numerous medium and fine common distinct iron stains; loose.

101 to 120 inches. Brown (10YR 5/3 moist) sand; loose; noncalcareous to 120 inches.

Note: The above profile had a slightly heavier layer from 30 to 36 inches which could possibly be a loam but it was still believed to be a sandy loam. Such somewhat heavier layers are typical in the moderately sandy soils in this area. The upper 3 feet contained some evidence of old decayed roots which are believed to have been shrub or tree roots.

SOIL Thurman sandy loam SOIL Nos. 859Nebr-26-5 LOCATION Dixon County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 12405-12413 December 1964

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											Coarse fragments			
		7F1a Total			Sand					Silt			2A2 > 2	2A2 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											Pct. of < 76mm			
0-6	A1p	72.8	18.7	8.5	0.5	11.7	18.9	36.7	5.0	12.3	6.4	30.8	67.8	-	-	-
6-11	A12	74.0	16.9	9.1	0.4	9.3	18.1	39.2	7.0	11.1	5.8	31.1	67.0	-	-	-
11-14	A3	78.9	13.5	7.6	0.9	11.6	20.4	40.0	6.0	7.8	5.7	27.0	72.9	-	-	-
14-18	AC	82.7	10.9	6.4	1.6	12.5	20.3	42.3	6.0	6.6	4.3	27.9	76.7	-	-	-
18-28	C1	84.8	8.1	7.1	0.5	11.3	21.8	44.2	7.0	5.3	2.8	27.8	77.8	-	-	-
28-34	C2	81.3	11.0	7.7	0.7	9.9	18.4	44.6	7.7	6.1	4.9	30.4	73.6	-	-	-
34-45	C3	82.7	10.4	6.9	0.4	9.6	20.6	44.7	7.4	6.4	4.0	31.5	75.3	-	-	-
45-53	C4	82.7	10.4	6.9	0.5	7.5	17.1	48.2	9.4	6.2	4.2	33.1	73.3	-	-	-
53-60	C5	87.6	7.1	5.3	0.3	5.1	20.7	53.9	7.6	4.4	2.7	28.1	80.0	-	-	-

Depth (in.)	6A1a Organic carbon Pct	6B1a Nitrogen Pct	C/N	6E1c Carbonate as CaCO ₃ Pct.	6C1a Ext. Iron as Fe ₂ O ₃ Pct.	Bulk density			Water content			pH		8C1a (1:1) H ₂ O
						4A1a Field-State g/cc	4B4 g/cc	4B1a g/cc	4B4 Field-State Pct	4B1a 1/10-Bar Pct	4B2 1/3-Bar Pct	4B2 15-Bar Pct	8D3 Ca/Mg	
0-6	0.77	0.066	12	-	0.5				15.1	8.3	3.9			5.8
6-11	0.54	0.058	9	-	0.5	1.69			7.9	16.9	9.5	4.4		6.4
11-14	0.44	0.046	10	-	0.5					11.4	7.8	3.0		6.5
14-18	0.28	0.030	9	-	0.4					8.3	6.1	2.7		6.6
18-28	0.20	0.025		-	0.4	1.69			9.7	9.0	5.4	3.2		6.7
28-34	0.17			-	0.4					10.6	6.7	3.4		6.8
34-45	0.09			-	0.4	1.77			6.3	7.4	4.6	2.8		6.9
45-53	0.10			-	0.4					8.4	5.8	2.7		6.9
53-60	0.06			-	0.3					6.4	3.9	2.0		7.0

Depth (in.)	Extractable bases 5B1a					6H1a Ext. Acidity	5A3a Sum Cations	5A1a NH ₄ OAc	8D3 Ca/Mg	Base saturation		
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum					5C3 Sum Cations Pct	5C1 Sum Cations Pct	
0-6	4.9	1.4	tr.	0.2	6.5	3.3	9.8	7.6	3.5		66	86
6-11	6.1	1.5	tr.	0.2	7.8	2.4	10.2	8.2	4.1		76	95
11-14	5.5	1.6	tr.	0.2	7.3	2.4	9.7	7.3	3.4		75	100
14-18	4.4	1.3	tr.	0.2	5.9	1.6	7.5	6.0	3.4		79	98
18-28	4.2	1.6	tr.	0.2	6.0	1.4	7.4	6.0	2.6		81	100
28-34	4.7	1.8	tr.	0.2	6.7	1.6	8.3	6.6	2.6		81	102
34-45	3.6	1.6	tr.	0.2	5.4	1.4	6.8	5.0	2.2		79	108
45-53	3.9	1.6	tr.	0.2	5.7	1.2	6.9	5.7	2.4		83	100
53-60	2.9	1.3	tr.	0.1	4.3	1.2	5.5	4.1	2.2		78	105

Depth (in.)	Ratios to Clay 8D1	
	NH ₄ OAc CEC	15-Bar Water
0-6	0.89	0.4
6-11	0.90	0.5
11-14	0.96	0.4
14-18	0.94	0.4
18-28	0.84	0.4
28-34	0.86	0.4
34-45	0.72	0.4
45-53	0.83	0.4
53-60	0.77	0.4

Soil type: Thurman sandy loam
 Soil No.: 859Nebr-26-5
 Location: 1000 feet south and 80 feet west of north 1/4 corner, Sec. 22, T28N, R4E, Dixon County, Nebraska; North-east Nebraska Experimental Farm, 2 miles east of Concord, Nebraska.
 Physiography: Gently rolling sand-loess hills area. Deep sand over Peorian loess.
 Relief: B slope; single convex slope.
 Slope: 3 to 4 percent northwest to west slope.
 Parent material: Eolian sand.
 Drainage: Well drained.
 Permeability: Moderately rapid.
 Land use: Cultivated; in sorghum.
 Described by: Herbert L. Kollmorgen and John Elder, November 3, 1959.

Horizon and
 Lincoln
 Lab. Number

Alp 12405	0 to 6 inches. Very dark brown (10YR 2/2 moist) sandy loam; weak medium and fine subangular blocky breaking to fine and very fine crumb; very friable moist; no effervescence; abrupt smooth lower boundary.
A12 12406	6 to 11 inches. Very dark brown (10YR 2/2 moist) fine sandy loam or loam; weak coarse subangular blocky breaking to fine and very fine crumb; very friable moist; no effervescence; clear smooth lower boundary.
A3 12407	11 to 14 inches. Very dark grayish brown to dark brown (10YR 3/2.5 moist) sandy loam; weak fine and medium subangular blocky to single grained; very friable moist; no effervescence; clear smooth lower boundary.
AC 12408	14 to 18 inches. Dark brown (10YR 3/3 moist) sandy loam; weak coarse and medium subangular blocky to single grained; very friable moist; no effervescence; clear smooth lower boundary.
C1 12409	18 to 28 inches. Dark brown (10YR 4/3 moist) sandy loam; weak very coarse subangular blocky to single grained; very friable moist; no effervescence; diffuse smooth lower boundary.
C2 12410	28 to 34 inches. Dark brown (10YR 4/3 moist) sandy loam; weak coarse subangular blocky to single grained; very friable moist; no effervescence; diffuse lower boundary.
C3 12411	34 to 45 inches. Dark brown (10YR 4/3 moist) sandy loam; single grained; very friable moist; no effervescence; diffuse smooth lower boundary.
C4 12412	45 to 53 inches. Dark brown (10YR 4/3 moist) sandy loam; weak coarse and medium subangular blocky to weak fine and fine subangular blocky; very friable or loose moist; no effervescence; gradual smooth lower boundary.
C5 12413	53 to 60 inches. Yellowish brown (10YR 5/4 moist) loamy sand; single grained and loose; no effervescence.

Borings were made below the pit to 120 inches. Colors were not checked in detail but varied from light brownish gray to pale brown and light yellowish brown. Textures were recorded as follows:

60 to 81 inches. Light fine sandy loam or loamy fine sand.

81 to 92 inches. Fine sandy loams.

92 to 120 inches. Loamy sands or sands.

SOIL Thurman loamy fine sand SOIL Nos. 860Nebr-70-1 LOCATION Pierce County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 13478-13483 December 1964

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1											Coarse fragments			
		1R1a Total		Sand						Silt			2A2 > 2	2A2 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														Pct. of < 76mm		
0-8	Alp	88.8	5.8	5.4	1.0	8.3	19.2	51.6	8.7	4.3	1.5	36.4	80.1	-	-	-
8-15	Al2	78.1	13.1	8.8	0.3	5.5	17.4	46.7	8.2	7.8	5.3	36.2	69.9	-	-	-
15-20	AC	81.6	10.2	8.2	0.2	5.2	20.2	48.8	7.2	6.6	3.6	33.6	74.4	-	-	-
20-29	C1	89.0	4.2	6.8	0.4	7.0	26.5	50.5	4.6	2.2	2.0	24.5	84.4	-	-	-
29-40	C2	88.4	4.7	6.9	0.8	6.4	20.2	53.5	7.5	2.1	2.6	32.2	80.9	-	-	-
40-60	C3	93.0	2.6	4.4	0.2	4.4	17.8	62.8	7.8	1.8	0.8	37.9	85.2	-	-	-
Depth (in.)	6A1a	6B1a	C/N	6R1c Carbonate as CaCO ₃	6C1a Ext. Iron as Fe ₂ O ₃ Pct.	Bulk density			Water content			pH				
	Organic carbon Pct.	Nitrogen Pct.				4A1a Field-State g/cc	g/cc	g/cc	4B4 Field-State Pct.	4E1a 1/10-Pieces Pot.	4E2 15-Bar Pot.	8C1a (1:1) H ₂ O	8C1a (1:1) H ₂ O			
0-8	0.36	0.043	8		0.2											6.1
8-15	0.60	0.063	10		0.3	1.58				10.0	12.6					6.1
15-20	0.37	0.044	8		0.3											6.3
20-29	0.18	0.024			0.3											6.5
29-40	0.14				0.2	1.66				7.0	8.1					6.5
40-60	0.05				0.1											6.6
Depth (in.)	Extractable bases 5B1a					5B1a Ext. Acidity	Cat. Exch. Cap.		8D3 Ca/Mg	Base saturation						
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	Sum		5A3a Sum Cat-NH ₄ OAc ions	5A1a		5C3 Sum Cat-ions Pct.	5C1 Sum NH ₄ OAc CEC Pct.					
0-8	2.9	0.4	tr.	0.3	3.6	2.5	6.1	4.1			59	88				
8-15	5.3	1.2	tr.	0.2	6.7	3.2	9.9	7.7			68	87				
15-20	4.8	1.3	tr.	0.2	6.3	2.5	8.8	6.8	4.4		72	93				
20-29	4.0	1.1	tr.	0.1	5.2	1.7	6.9	5.4	3.7		75	96				
29-40	3.5	1.3	tr.	0.1	4.9	1.7	6.6	5.1	3.6		74	96				
40-60	1.8	0.7	tr.	0.1	2.6	1.0	3.6	3.0	2.7		72	87				
Depth (in.)	Ratios to Clay 8D1															
	NH ₄ OAc CEC	15-Bar Water														
0-8	0.76	0.4														
8-15	0.88	0.5														
15-20	0.83	0.4														
20-29	0.79	0.4														
29-40	0.74	0.4														
40-60																

a. One or more horizons has relatively low cation exchange capacity. As cation exchange capacity decreases, the relative error of base saturation increases. Trace quantities are omitted from the sum of bases. For very low CEC values, this omission contributes significantly to the relative error of base saturation.

Soil type: Thurman loamy fine sand
 Soil No.: S60Nehr-70-1
 Location: 1700 feet north and 210 feet west of southeast corner, Sec. 22, T27N, R3W, Pierce County, Nebraska.
 Relief: Gentle slope.
 Physiography: Undulating sandy upland.
 Slope: 2 to 3 percent; south slope.
 Parent material: Eolian sand.
 Drainage: Well drained.
 Permeability: Moderately rapid.
 Land use: Cropland; in corn, 1960.
 Described by: Herbert L. Kollmorgen and John Kider, June 1960.

Horizon and
 Lincoln
 Lab. Number

Alp 13478	0 to 8 inches. Dark gray to dark grayish brown (10YR 4/1.5 moist) loamy fine sand; single grained structure; loose moist; abrupt smooth boundary.
A12 13479	8 to 15 inches. Very dark gray (10YR 3/1 moist) fine sandy loam; weak very fine crumb breaking to single grained structure; very friable moist; clear wavy boundary.
AC 13480	15 to 20 inches. Very dark grayish brown to dark grayish brown (10YR 3.5/2 moist) fine sandy loam; weak very fine crumb breaking to single grained structure; very friable moist; clear wavy boundary.
C1 13481	20 to 29 inches. Dark grayish brown (10YR 4/2 moist) light fine sandy loam; single grained structure; loose moist; gradual wavy boundary.
C2 13482	29 to 40 inches. Dark grayish brown to brown (10YR 4/2.5 moist) loamy fine sand; single grain structure; loose moist; gradual wavy boundary.
C3 13483	40 to 72 inches. Sampled 40 to 60 inches. Brown (10YR 5/3 moist) fine sand; single grain structure; loose moist.

SOIL TYPE Tripp LOCATION Scotts Bluff County, Nebraska
 fine sandy loam

SOIL NOS. 861Nebr-79-2 LAB. NOS. 15683-15690

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1R1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2	(19mm)		
2.0	1.0-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.20-0.02	0.02-0.002	1			
0-9	Ap	0.6	3.0	4.9	21.0	35.8	23.2	11.5	65.6	6.6	1	vfsl
9-14	A11	0.4	3.0	4.9	19.3	37.0	24.1	11.3	66.1	7.4	Tr.	vfsl
14-24	A12	0.2	3.9	5.7	20.4	36.0	23.0	10.8	65.3	6.6	1	vfsl
24-35	C11ca	0.4	3.7a	5.8a	19.8a	36.1a	25.1	9.1	66.8	7.0	Tr.	vfsl
35-46	C12ca	0.2	3.2a	5.0a	17.7a	35.9a	28.4	9.6	66.7	8.8	Tr.	vfsl
46-54	C21ca	0.1	0.6a	1.2a	5.5a	31.0a	51.1	10.5	68.5	17.4	Tr.	sil
54-66	C22ca	Tr.	0.6a	1.0a	7.1a	40.0a	44.1	7.2	77.8	11.6	Tr.	1/vfsl
66-74	C3	0.2	2.9a	4.9a	19.1a	40.4a	25.6	6.9	70.9	6.7	1	vfsl

8C1a	Extractable Organic Matter	Bulk Density				Moisture Retention					
pH	able Iron as Fe %	6A1a	6B1a	C/N	Field Moist		30 Cm.		A.D.	4B1H	15-Atm. Sieved %
		O.C.	N		4B4	4A1a	4B3	4A1c	4A1b		
		%	%		% M.	g/cc	% M.	g/cc	g/cc	Pieces %	
7.7		0.54	0.058	9					20.1		6.2
7.5		0.38	0.047	8					22.0		6.6
7.5		0.33	0.035	9					22.8		6.6
7.8		0.26	0.036	7					22.9		6.8
7.9		0.25			23.5	1.38	33.0	1.34	1.40		7.4
7.8		0.22							35.3		10.9
7.8		0.13							34.5		7.9
7.9		0.09									6.1

5A1a	EXTRACTABLE CATIONS					5B1a	Base Sat.		8D1			Carb nate as CaCO3	
CATION EXCHANGE CAPACITY NH4OAc	6N2b	6O2b	6H1a	6P2a	6Q2a	on NH4OAc	on Sum	Ratios to Clay			Whole Sample	Clay-Size	
	Ca	Mg	H	No	K	Exch. %	plus H	15-Atm. Moist.	Cat. Exch. Cap.	Iron	% 6H1	% 6K1c	
	milliequivalents per 100g. soil					5C1	% 5C3						
12.5	12.6	2.9	0.9	0.3	0.9	134	95	.54	1.09		Tr.	-	
13.6	10.5	3.2	1.4	0.3	0.9	110	91	.58	1.20		Tr.	-	
13.3	10.1	2.9	0.7	0.3	0.8	106	95	.61	1.23		Tr.	-	
12.3				0.5	0.8			.75	1.35		2	-	
12.7				0.5	0.7			.77	1.32		3	1	
16.1				0.6	0.7			1.04	1.53		13	6	
15.6				0.5	0.9			1.10	2.17		6	2	
12.0				0.3	0.8			0.88	1.74		3	Tr.	

a. Few carbonate nodules.

Soil type: Tripp fine sandy loam, loamy substratum
 Soil No.: 861Nebr-79-2
 Location: .46 mile east and .19 mile south of northwest corner Sec. 11, T23N, R56W, Scotts Bluff County, Nebraska.
 Parent material: Alluvium.
 Physiography: North Platte Valley high terrace.
 Relief: 0 to 2 feet.
 Drainage: Somewhat excessive.
 Elevation: 4,100 feet.
 Ground water: Deep.
 Slope: Less than 1 percent.
 Moisture: Moist.
 Root distribution: Numerous to 9 inches, plentiful to 46 inches, none below.
 Erosion: Slight.
 Permeability: Moderately rapid.
 Land use: Irrigated corn.
 Date: August 28, 1961. Described by: Donald A. Yost.

Horizon and
 Lincoln
 Lab. Number

Ap 0 to 9 inches. Light brownish gray (10YR 6/2 dry) fine sandy loam, dark grayish brown (10YR 4/2) when moist; weak fine and medium granular structure; soft when dry, very friable when moist; noncalcareous; pH (paste) 7.8; pH (2:1) 7.8; nonsaline; abrupt smooth boundary.
 15683

A11 9 to 14 inches. Color, texture and consistence as in above horizon. Weak coarse blocky structure; noncalcareous; pH (paste) 7.6; pH (2:1) 7.8; nonsaline; clear smooth boundary.
 15684

A12 14 to 24 inches. Color, texture and consistence as in above horizon; massive (structureless); noncalcareous; pH (paste) 7.6; pH (2:1) 8.1; nonsaline; abrupt wavy boundary.
 15685

C11ca 24 to 35 inches. Light gray (10YR 7/2 dry) fine sandy loam, grayish brown (10YR 5/2) when moist; weak medium blocky structure; soft when dry, very friable when moist; very strongly calcareous; pH (paste) 7.8; pH (2:1) 8.1; nonsaline; clear wavy boundary.
 15686

C12ca 35 to 46 inches. Soil characteristics are as given in above horizon. This is an arbitrary separation made because of the thickness of the material between 24 and 46 inches; pH (paste) 7.9; pH (2:1) 8.0; nonsaline; abrupt wavy boundary.
 15687

C21ca 46 to 54 inches. White (10YR 8/1 dry) silt loam, light gray (10YR 7/2) when moist; moderate medium subangular blocky structure; hard when dry, friable when moist; very strongly calcareous; pH (paste) 7.8; pH (2:1) 7.8; nonsaline; clear wavy boundary.
 15688

C22ca 54 to 66 inches. White (10YR 8/2 dry) very fine sandy loam, light brownish gray (10YR 6/2) when moist; weak medium subangular blocky structure; soft when dry, very friable when moist; very strongly calcareous; pH (paste) 7.8; pH (2:1) 7.6; nonsaline; clear wavy boundary.
 15689

C3 66 to 74+ inches. Very pale brown (10YR 8/3 dry) fine sandy loam, brown (10YR 5/3) when moist; weak medium subangular blocky structure; soft when dry, very friable when moist; strongly calcareous; pH (paste) 7.8; pH (2:1) 7.9; nonsaline.
 15690

Note: The profile herein described is modal for this particular phase and for the soils as they occur in Scotts Bluff County. The lower boundary of the C12ca horizon is tongued through the horizon below. It was observed that roots did not penetrate the C21ca horizon. A 3-inch Krotovina was noted in the lowest horizon sampled. Horizons Ap, C11ca, and C21ca were sampled for the Bureau of Public Roads. The very fine sands include approximately 30 percent quartz, 20 percent identified feldspar, 30 percent highly altered grains, and 15 percent glass shards. The pattern of feldspar alteration changes little with depth. Some grains are thought to be altered glass. The index of refraction of these grains is less than that of clove oil. A minor portion of the glass appears to be obsidian. Accessory minerals in order of decreasing abundance are hornblende, pyroxene (subrounded, greenish, perhaps diopside) epidote-zoisite, zircon, garnet, and mica. A few grains of primary carbonate occur in the lower part of the profile. (Method 7B1)

SOIL TYPE Tripp LOCATION Scotts Bluff County, Nebraska
 fine sandy loam

SOIL NOS. S61Nebr-79-1 LAB. NOS. 15675-15682

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									SAI		TEXTURAL CLASS
		1B1a		3A1					2A2				
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	> 2 (<19mm)		
		2.1	1.0-5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002					
0-9	A1p	0.7	2.1	5.4	23.9	39.9	18.8	9.2	69.0	4.8	Tr.	vfsl	
9-17	A1	0.6	2.2	6.4	24.9	36.0	20.9	9.0	65.2	6.5	Tr.	vfsl	
17-26	AC	0.7	1.9	5.6	26.2	36.9	18.6	10.1	66.6	5.2	1	vfsl	
26-37	C1ca	0.3	2.2	5.5	25.6	37.5	20.3	8.6	67.7	6.3	1	vfsl	
37-41	C21ca	0.3	1.3a	3.6a	17.0a	38.9a	30.2	8.7	70.0	10.2	1	vfsl	
41-53	C22ca	0.1	1.6a	3.4a	15.1a	39.8a	31.4	8.6	70.1	10.9	1	vfsl	
53-63	C31	0.5	1.7a	3.3a	13.4a	37.3a	35.9	7.9	70.6	11.3	2	vfsl	
63-73+	C32	0.9a	1.6a	3.4a	16.0a	38.3a	33.0	6.8	72.0	9.4	1	vfsl	

8C1a	6C1a	Organic Matter			Bulk Density				Moisture Retention		
		Ext.	6A1a	6B1a	Field Moist		30 Cm.		A.D.	4B1b	4B2
pH	Iron as Fe	0.0	N	C/N	4B4	4A1a	4B3	4A1c	4A1b	Pieces	15-Atm. Sieved
1:1	%	%	%		% M.	g/cc	% M.	g/cc	g/cc	%	%
7.3	0.4	0.57	0.063	9	6.8	1.68	18.1	1.61	1.68	19.1	5.4
7.2	0.4	0.35	0.045	8	10.9	1.59	19.8	1.56	1.61	18.4	5.6
7.4	0.4	0.29	0.041	7	9.7	1.46	16.7	1.42	1.46	18.4	5.8
7.8	0.4	0.25									5.9
7.8	0.4	0.18									7.8
7.8	0.3	0.17			17.7	1.32	32.0	1.30	1.34	30.3	8.4
7.8	0.3	0.12									7.4
7.9	0.4	0.10									6.8

5A1a	EXTRACTABLE CATIONS					5B1a	Base Sat.		8D1			Carbonate as CaCO ₃	
	6N2b	6O2b	6H1a	6P2a	6Q2a		on	on Sum	Ratios to Clay		as CaCO ₃		
CATION EXCHANGE CAPACITY NH ₄ OAc	Ca	Mg	H	Na	K	NH ₄ OAc Exch. %	Bases plus H	15-Atm. Moist.	Cat. Exch.	Iron	Whole Sample % 6E1b	Clay-Size % 6E1c	
	milliequivalents per 100g. soil						% 5C1	% 5C3					
10.6	7.9	2.5	1.4	0.3	1.2	112	89	.59	1.15	.04	Tr.	-	
11.2	8.1	2.4	1.2	0.2	1.3	107	91	.62	1.24	.04	Tr.	-	
11.7	9.2	2.4	0.9	0.3	1.0	110	93	.57	1.16	.04	Tr.	-	
11.8				0.3	1.0			.69	1.37	.05	Tr.	-	
13.6				0.4	1.0			.90	1.56	.04	4	2	
13.8				0.4	1.1			.98	1.60	.03	5	2	
13.9				0.4	1.3			.94	1.76	.04	3	1	
13.4				0.4	1.2			1.00	1.97	.06	2	Tr.	

a. Few carbonate nodules.
 b. 6 Kg/M² organic carbon to 60 inches.

Soil type: Tripp fine sandy loam, loamy substratum
 Soil No.: 961Neb-79-1
 Location: .26 mile south and .09 mile east of northwest corner Sec. 21, T23N, R55W, Scotts Bluff County, Nebraska.
 Parent material: Alluvium.
 Physiography: North Platte Valley terrace.
 Relief: 0 to 2 feet.
 Drainage: Somewhat excessive.
 Elevation: 4,130 feet.
 Ground water: Very deep; farm operator states ground water is located in fissures of the underlying Brule formation.
 Slope: Less than 1 percent.
 Moisture: Moist.
 Erosion: Slight.
 Root distribution: Plentiful to 9 inches; few to 73 inches.
 Permeability: Moderately rapid.
 Land use: Irrigated corn. 200 pounds of 21-53-0 fertilizer were applied to each acre of the soil early in the spring.
 In addition, barnyard manure at the rate of 10 spreader loads per acre was applied and plowed under.
 Date: August 28, 1961. Described by: Donald A. Yost.

Horizon and
 Lincoln
 Lab. Number

A1p 0 to 9 inches. Grayish brown (10YR 5.5/2 dry) fine sandy loam, dark grayish brown (10YR 4/2) when moist; weak fine granular structure; soft when dry, very friable when moist; noncalcareous; abrupt smooth boundary.

A1 9 to 17 inches. Color, texture and consistence as in above horizon; weak medium prismatic structure; noncalcareous; gradual smooth boundary.

AC 17 to 26 inches. Light brownish gray (10YR 6/2 dry) fine sandy loam, dark grayish brown (10YR 4/2) when moist; weak medium prismatic structure; soft when dry, very friable when moist; noncalcareous; clear wavy boundary.

C1ca 26 to 37 inches. Light gray (10YR 6.5/2 dry) fine sandy loam, grayish brown (10YR 4.5/2) when moist; massive; soft when dry, very friable when moist; slightly calcareous; clear wavy boundary.

C21ca 37 to 41 inches. Light gray (10YR 7/2 dry) very fine sandy loam, grayish brown (10YR 5/2) when moist; weak fine subangular blocky structure; soft when dry, very friable when moist; very strongly calcareous; clear wavy boundary.

C22ca 41 to 53 inches. White (10YR 8/2 dry) very fine sandy loam, pale brown (10YR 6/2.5) when moist; weak fine subangular blocky structure; slightly hard when dry, friable when moist; very strongly calcareous; gradual wavy boundary.

C31 53 to 63 inches. Very pale brown (10YR 8/3 dry) fine sandy loam, brown (10YR 5/3) when moist; weak fine subangular blocky structure; soft when dry, very friable when moist; very strongly calcareous; gradual wavy boundary.

C32 63 to 73+ inches. This is an arbitrary separation made because of the unusual thickness of the material between 53 and 73 inches. Soil characteristics are as given in the horizon above.

Note: Krotovinas, 2 to 3 inches in diameter, are present at depths of 30 to 42 inches. Mycelial lime is evident in the lower two horizons. Depth to violently effervescent lime varies from 26 inches to 43 inches on north wall of pit. Farm operator states mixed sand and gravel are present at a depth of about 15 feet at this location. Gravel is dry. The very fine sands include approximately 30 percent quartz, 20 percent identified feldspar, 30 percent highly altered grains, and 15 percent glass shards. The pattern of feldspar alteration changes little with depth. Some grains are thought to be altered glass. The index of refraction of these grains is less than that of clove oil. A minor portion of the glass appears to be obsidian. Accessory minerals in order of decreasing abundance are hornblende, pyroxene (subrounded, greenish, perhaps diopside), epidote-zoisite, zircon, garnet, and mica. A few grains of primary carbonate occur in the lower part of the profile. (Method 7B1)

SOIL SURVEY LABORATORY Mandan, N. Dak.

OIL TYPE Tripp LOCATION Scotts Bluff County, Nebraska
loam

SOIL NOS. S53Nebr-79-6-(1-7) LAB. NOS. 1973-1979

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 ($\leq 19\mu$)		
0-4	Alp1	2.5	5.4	4.7	9.2	33.6	30.7	13.9	61.6	8.0	2	vfs1	
4-11	Alp2	2.4	5.6	5.0	9.2	32.7	31.4	13.7	60.6	8.8	2	vfs1	
11-16	B21	4.1	9.5	6.8	10.6	26.3	27.4	15.3	50.6	8.5	2	fs1	
16-21	B22	1.9	6.0	5.2	10.2	28.2	28.7	19.8	53.6	9.0	1	1	
21-27	B3	2.0	5.1	4.7	8.8	28.0	33.3	18.1	54.7	11.8	1	1	
27-37	Cca	0.1	0.6	0.6	2.6	23.5	56.2	16.4	55.3	26.0	-	sil	
37-52	C1	-	0.5	0.3	1.9	31.9	53.7	11.7	66.4	20.6	-	sil	
8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY EC $\times 10^3$ MILLIMHOS PER CM 8A1a	6E1a	6F1a	MOISTURE TENSIONS			
	8C1a	8C1a	6A1a	ORGANIC CARBON	NITROGEN	C/N		EST. SALT (BUREAU CUP)	CoCO ₃ equivalent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	%	%	%			%	%	%	%	%	
7.5	7.9	8.1	0.65			a	0.9	-				6.9	
7.8	8.1	8.2	0.63				1.0	-				6.8	
7.4	7.5	7.6	0.43				1.0	-				7.7	
7.3	7.6	7.4	0.38				1.2	-	-			9.6	
7.4	8.1	8.0	0.36				0.9	-	-			9.7	
7.8	8.5	8.7	0.29				0.8	19	-			13.0	
8.0	8.6	9.0	0.14				0.9	12	-			10.6	
5A1a	5B1a		CATIONS		5B1b	5E	SATURATION EXTRACT SOLUBLE			8A			
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE		EXCH. No %	6P1a	6Q1a	MOISTURE AT SATURATION					
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K		Na	K	%					
	milliequivalents per 100g. soil					milliequivalents per liter							
13.3	9.8	2.3	0.1	1.5	1	3.5	1.2					35.3	
13.4	9.7	2.3	0.3	1.8	2	5.2	1.2					35.2	
14.5	10.5	2.5	0.3	1.3	2	3.8	0.8					36.2	
18.2	13.5	3.8	0.2	1.3	1	3.8	0.6					42.3	
19.4	16.0	3.7	0.3	1.1	2	3.2	0.4					43.8	
19.8		4.7	0.4	1.2	2	3.2	0.4					48.3	
19.6		6.8	0.6	2.1	3	4.1	0.8					45.5	

a. Less than 0.20%

Soil type: Tripp loam

Soil No.: S53Nebr-79-6-(1-8)

Date sampled: October 2, 1953

Location: 0.3 mile east, 125 feet north of SW corner Sec. 12, T22N R54W, Scotts Bluff County, Nebraska.

Topographic position: High terrace, profile developed in loess over gravels of middle Pleistocene age.

Relief: Slight, sample site on smooth slope less than 1 percent, flat.

Drainage: Well drained.

Described by: John Elder.

Ground water: Many feet below surface.

Root distribution: Normal above 27 inches. 27-37 inch horizon had a limiting effect. Roots penetrate this horizon but growth is restricted.

Land use: Irrigated from ditch--beans 1953. Harvested prior to sampling, no yield figure available, but adjacent areas indicate high yields of corn, sugar beets, beans and alfalfa can be expected on areas having profiles similar to the site sampled.

Mandan

Lab.No.	Horizon	
1973	Alp1	0-4 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam. Moderate very coarse subangular blocky to moderate fine and very fine granular, hard dry, friable moist, noncalcareous, a few medium and coarse gravel scattered on surface. Clear, smooth boundary.
1974	Alp2	4-11 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam. Weak coarse subangular blocky to fine and very fine moderate granular, hard dry, friable moist, crushes to slightly lighter color, noncalcareous. Abrupt, smooth boundary.
1975	E21	11-16 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay loam; weak coarse prismatic to moderate fine granular, hard dry, friable moist, noncalcareous, many worm casts and insect holes, a few coarse sand grains and small gravel; clear, smooth boundary.
1976	E22	16-21 inches. Grayish brown (10YR 5/2.5 dry) to very dark grayish brown (10YR 3.5/2 moist) silty clay loam. Coarse moderate subangular blocky to fine and very fine strong granular, hard dry, friable moist, numerous coarse sand grains and a few small gravel, some worm casts and insect openings; gradual, smooth boundary.
1977	B3	21-27 inches. Grayish brown (10YR 5/2.5 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam; coarse weak subangular blocky to fine and very fine weak granular, soft dry, very friable moist, noncalcareous, faintly darker coatings on some aggregates, few coarse sand grains and an occasional small granitic gravel; abrupt, wavy boundary.
1978	Cca	27-37 inches. White (10YR 8/2 dry) to light grayish brown (10YR 6.5/2 moist) silt loam. Moderate thick platy to moderate medium and fine granular in upper part, weak coarse subangular blocky to weak fine granular, soft dry, very friable moist, many fine white lime spots and coatings on aggregates, some fine brown organic stains and decaying roots in root openings, violent effervescence; permeability is slow. This horizon is characteristic of the Tripp soils on this terrace level. The depth to and thickness of this horizon is variable. It is a genetic horizon and the variations of thickness and depth from the surface are probably significant in the use and management of the soils. Clear, wavy boundary.
1979	C1	37-52 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) very fine sandy loam or loam. Massive to single grain, soft dry, very friable moist, few fine white lime specks, violent effervescence; abrupt, smooth boundary.
--	D	52-60+ inches. Not sampled for laboratory. Fine and medium sand and fine to coarse gravel, limy coating on sand and gravels.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Tripp loam **LOCATION** Scotts Bluff County, Nebraska

SOIL NOS. S53Nebr-79-7-(1-7) **LAB. NOS.** 1980-1986

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a					3A1					
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002 (<19mm)	2A2 > 2	
0-7	A1p	0.4	1.6	2.0	8.0	41.0	27.2	19.8	62.6	11.5	Tr.	vfsl
7-13	A12	0.7	1.5	1.9	7.8	39.8	28.8	19.5	62.9	11.5	Tr.	vfsl
13-20	B21	0.2	2.0	2.6	9.3	41.1	27.9	16.9	65.3	10.4	1	vfsl
20-30	B22	0.5	2.1	3.2	9.9	40.8	28.7	14.8	65.5	10.9	1	vfsl
30-35	B3	0.6	2.0	2.8	8.5	40.7	32.2	13.2	66.2	12.7	1	vfsl
35-45	Cca	-	0.4	1.1	3.5	40.0	48.2	6.8	70.2	20.9	-	vfsl
45-63	C1	0.3	1.9	3.0	8.4	37.4	38.8	10.2	67.2	14.6	1	1

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2 ESTD SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a CoCO ₂ equiv- alent %	6F1a GYPSUM mg./100g. SOIL	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6A1a	6A1a					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITRO- GEN %	C/N					%	%	%
7.5	7.9	8.0	0.84			a	0.7	-				10.0
7.4	7.7	7.5	0.71				0.7	-				9.9
7.3	7.5	7.2	0.56				0.8	-				8.9
7.4	7.5	7.1	0.38				0.8	-				8.6
7.7	8.3	8.4	0.30				1.0	3				9.3
7.7	8.4	8.6	0.19				1.2	13				12.6
7.7	8.3	8.7	0.14				1.0	5				8.8

5A1a CATION EXCHANGE CAPACITY NH ₄ , OAc	5B1a CATIONS				5B1b EXCHANGEABLE	5D2 EXCH. No %	6A1 SATURATION EXTRACT SOLUBLE		8A MOISTURE AT SATU- RATION %
	EXTRACTABLE						6F1a	6Q1a	
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K			Na	K	
	←----- milliequivalents per 100g. soil ----->						←----- milliequivalents per liter ----->		
19.6	15.9	3.5		0.1	1.5	-	2.3	0.6	41.7
18.8	14.7	3.5		0.1	1.3	-	2.0	0.4	45.0
17.1	13.4	3.3		0.1	1.0	-	2.3	0.4	42.6
17.7	14.4	3.3		-	0.9	-	2.6	0.4	42.4
17.4		3.4		0.1	0.8	-	2.6	0.4	40.3
19.8		3.7		0.3	0.9	2	2.6	0.4	47.6
16.9		3.1		0.3	0.8	2	2.6	0.4	40.0

a. Less than 0.20%

Soil type: Tripp loam

Soil No.: 853Hebr-79-7-(1-8)

Date sampled: October 2, 1953

Location: Twelve hundred feet south and 100 feet east of NW corner Sec. 19, T22N R53W, Scotts Bluff County, Nebraska

Topographic position: High terrace, profile developed in loess over gravels of middle Pleistocene age.

Relief: Slight, sample site on smooth slope of less than 1 percent, flat.

Drainage: Well drained.

Described by: John Elder.

Ground water: Many feet below surface.

Root distribution: Normal above 35 inches. 35 to 45 inch horizon has a limiting effect. Roots penetrate this horizon but growth is restricted.

Land use: Irrigated from ditch--beans 1953. Crops on adjacent areas indicate high yields of adapted crops.

Mandan

Lab. No.	Horizon	Description
1980	Alp	0-7 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam. Coarse moderate subangular blocky to fine moderate granular, hard dry, friable moist, noncalcareous, abrupt, smooth boundary.
1981	A12	7-13 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) loam. Coarse weak subangular blocky to fine moderate blocky and granular, hard dry, friable moist, a few coarse sand grains, noncalcareous, numerous worm casts and insect openings. Clear, smooth boundary.
1982	B21	13-20 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay loam. Weak coarse prismatic to moderate fine granular, hard dry, friable moist, crushes to slightly lighter color, noncalcareous, many large insects and root openings. Gradual, smooth boundary.
1983	B22	20-30 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam. Weak coarse prismatic to moderate fine subangular blocky and moderate fine granular, hard dry, friable moist, noncalcareous, few coarse sand grains and fine gravel. Gradual, wavy boundary.
1984	B3	30-35 inches. Light gray (10YR 7/2 dry) to grayish brown (10YR 5/2 moist) silt loam. Weak coarse subangular blocky to moderate fine and very fine granular, soft dry, very friable moist, noncalcareous; clear, wavy boundary.
1985	Cca	35-45 inches. White (10YR 8/2 dry) to light brownish gray (10YR 6/2.5 moist) silt loam. Very thick platy breaking to various sized blocks and moderate firm granules, slightly hard dry, friable moist, many fine white lime spots, pores almost filled with lime accumulations, quite compact, root and moisture penetration is slowed by this horizon, violent effervescence, clear, wavy boundary.
1986	C1	45-63 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) loam. Massive to single grain or weak very fine granules, soft dry, very friable moist, violent effervescence, abrupt wavy boundary.
--	D	63+ inches. No sample sent to laboratory. Medium and coarse sand and fine and medium gravel. Limy coatings on sand and gravels. Continues to an undetermined depth. Becomes coarser with depth.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Ulysses **LOCATION** Scotts Bluff County, Nebraska
silt loam

SOIL NOS. 853Nehr-79-1-(1-8) **LAB. NOS.** 1939-1946

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1					2A2			
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2			
0-5	Alp	-	0.3	0.2	2.8	35.0	41.1	20.6	62.8	15.5	-	1
5-10	B21	-	-	-	3.6	33.2	39.9	23.3	60.5	15.0	-	1
10-15	B22	-	-	0.4	2.2	32.1	45.0	20.3	60.9	18.0	-	1
15-21	Cca	-	-	0.8	3.0	26.5	54.4	15.3	57.3	25.8	-	s11
21-27	C1	-	-	0.4	2.4	32.3	53.7	11.2	64.6	23.4	-	s11
27-34	C2	-	-	-	1.5	24.1	62.4	12.0	63.6	24.0	-	s11
34-43	C3	-	-	-	1.6	28.4	55.3	14.7	63.8	21.1	-	s11
43-60+	C4	-	-	-	1.5	31.2	53.4	13.9	65.7	20.1	-	s11

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	6E1a CoCO ₃ equivalent %	6F1a GYPSUM mg./100g SOIL	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	4B2								
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N					1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
6.9	7.1	7.4	1.15			a.	0.6	-				11.3
7.2	7.5	7.5	0.78				0.6	-				13.0
7.6	8.1	8.4	0.73				0.6	1				13.7
7.8	8.4	8.7	0.56				0.6	16	-			16.9
7.9	8.5	8.8	0.31				0.6	14	-			13.8
7.9	8.5	8.8	0.22				0.6	11	-			11.8
8.1	8.8	9.1	0.16				0.8	13	-			11.2
8.3	9.1	9.5	0.09				0.9	8	-			10.8

5A1a CATION EXCHANGE CAPACITY NH ₄ OAc	5B1a EXTRACTABLE		5B1b EXCHANGEABLE		5D2 EXCH. No %	6A1a SATURATION		6Q1a EXTRACT SOLUBLE		8A MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K		6P1a No	6Q1a K			
	← milliequivalents per 100g. soil →					← milliequivalents per liter →				
22.8	17.7	3.0	0.4	2.3	2	0.6	1.0			45.3
26.0	22.4	3.4	0.5	1.9	2	0.6	0.6			54.0
27.1		3.9	0.4	2.0	1	0.6	0.6			53.1
24.5		5.4	0.5	2.4	2	0.6	0.6			57.9
23.3		6.4	0.5	2.8	2	0.6	0.8			52.2
22.6		7.9	0.5	3.3	2	1.5	1.0			49.7
21.2			1.6	3.6	8	4.9	1.0			42.8
20.8			3.0	3.5	14	7.6	0.6			41.5

a. Less than 0.20%

Date: September 30, 1953.

Location: 0.3 mile north of SE corner Sec. 36, T22N R56W, Scotts Bluff County, Nebraska.

Topographic position: Loess covered upland (Peorian and later).

Relief: Slight, smooth 2 percent slope, northeast facing.

Drainage: Well drained.

Ground water: Many feet below surface.

Root distribution: Normal throughout. No limiting horizons.

Land use: Dryland wheat 1953. Stubble indicates high yield for area.

Soil type: Ulysses silt loam

Soil No.: S53Webr-79-1-(1-8)

Described by: John Elder.

Mandan

Lab.No. Horizon

- 1939 Alp 0-5 inches. Grayish brown (10YR 5.5/2 dry) to dark grayish brown (10YR 4/2 moist) silt loam. Weak coarse subangular blocky to weak fine granular, tendency toward very thick platy; hard dry, friable moist, abundant roots, noncalcareous, abrupt, smooth boundary.
- 1940 B21 5-10 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam. Moderate very coarse prismatic breaking to moderate fine granular; hard dry, friable moist, abundant roots which penetrate aggregates but tend to follow aggregate planes, worm holes and casts numerous, noncalcareous, clear, irregular boundary.
- 1941 B22 10-15 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) silty clay loam. Weak medium prismatic breaking to weak fine subangular blocky and weak very fine granular, hard dry, friable moist, abundant roots, noncalcareous, clear, wavy boundary.
- 1942 Cca 15-21 inches. White (10YR 8/2.5 dry) to pale brown (10YR 6/2.5 moist) silt loam. Moderate, coarse subangular, blocky to weak fine granular, slightly hard dry, friable moist, violent effervescence, white lime coatings in pores and root openings; fine roots abundant, diffuse, wavy boundary.
- 1943 C1 21-27 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Weak coarse subangular blocky to weak fine and medium subangular blocky, soft dry, very friable moist, few faint lime coatings along root channels and pore openings, violent effervescence, diffuse wavy boundary.
- 1944 C2 27-34 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Very weak coarse subangular blocky to very weak fine subangular blocky and very weak very fine granular, soft dry, very friable moist, violent effervescence, few fine roots, numerous very fine pores, diffuse, wavy boundary.
- 1945 C3 34-43 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) silt loam. Massive to single grain, soft dry, very friable moist, violent effervescence, few fine white specks of carbonates in pore openings, few fine roots, numerous very fine pore openings, diffuse, wavy boundary.
- 1946 C4 43-60+ inches. Very pale brown (10YR 8/3 dry) to 10YR 6/3 moist silt loam or very fine sandy loam, massive to single grain or very weak fine crumb, soft dry, very friable moist, violent effervescence, few fine roots, numerous very fine pores. Continues downward to an undetermined depth where the loess rests on unweathered Brule formation.

SOIL TYPE Valentine LOCATION Arthur County, Nebraska
 fine sand

SOIL NOS. S54Nebr-3-2-(1-4) LAB. NOS. 2430-2439

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1b					3A1						2A2
		VERY COARSE SAND 2.1	COARSE SAND 1.05	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2		
0-4	A1	0.1b	2.6	12.1	58.8	18.7	3.6	4.1	58.3	1.8	-	fs	
4-8	AC	-	1.8	10.0	60.6	22.5	1.7	3.4	65.7	0.9	-	fs	
8-14	C1	-	2.2	11.5	60.8	21.2	1.3	3.0	63.0	0.6	-	fs	
14-60	C2	-	2.1	11.3	61.9	21.3	0.2	3.2	63.3	0.2	-	fs	
		pH		ORGANIC MATTER			ESTD SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHS PER CM	CoCO ₃ equiv-gram	GYPSUM me./100g SOIL	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a	8C1a	6A1a	6A1a	6A1a	4B1a					4B1a	4B2	
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
6.7	7.2	7.3	0.76	.058	13.1					7.6	4.6	3.1	
6.7	7.4	7.4	0.44	.037	11.9					5.8	3.4	2.7	
6.9	6.9	7.0	0.28	.025	11.2					4.8	2.9	2.0	
6.7	6.9	6.9	0.13							4.3	2.6	1.6	
		EXTRACTABLE CATIONS					BASE SAT. %	Na	K	5A3a	8D3	MOISTURE AT SATURATION %	
5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	6P2b Ca	6O2b Mg	H	6P2a Na	6O2a K	5A3a Sum Cations me/100g				8D3 Ca/Mg			
	milliequivalents per 100g. soil					5C1							
5.2	3.3	0.7		0.1	0.5	88			4.6	4.7			
4.0	2.6	0.8		0.1	0.3	95			3.8	3.2			
3.4	2.4	0.3		0.1	0.2	88			3.0	3.0			
3.0	2.0	0.5		0.1	0.2	93			2.8	4.0			

a. Particle size analyses by Beltsville Laboratory
 b. Organic matter in sand fractions.

Soil type: Valentine fine sand

Soil No.: S54Nebr-3-2-(1-4)

Location: 12.1 miles north of Arthur, Arthur County, Nebraska on Arthur-Hyannis road; 900 feet north and 110 feet east of southwest corner Sec. 4, T20N, R38W.

Topography: On northwest facing slope of about 5 percent gradient, bordering a "sandhill" valley. A large grove of cottonwood trees about .5 mile west-northwest of the sample site.

Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|----------------|--------|--|
| 2436 | A ₁ | 0-4" | Dark grayish brown(10YR 4.5/2, dry) to very dark grayish brown (10YR 3/2, moist) fine sand; single grained; slightly hard, dry but crushes easily between fingers; very friable, moist; clear smooth lower boundary. |
| 2437 | AC | 4-8" | Grayish brown (10YR 5/2, dry) to dark grayish brown (10YR 4/2, moist) fine sand; single grained; loose, dry and moist; except a few slightly hard lumps when spaded out, dry; clear smooth lower boundary. |
| 2438 | C ₁ | 8-14" | Brown (10YR 5/2.5, dry) to brown (10YR 4.5/3, moist) fine sand; single grained; slightly hard or slight resistance to digging when dry; very friable, moist; gradual smooth lower boundary. |
| 2439 | C ₂ | 14-60" | Pale brown (10YR 6/3, dry) brown (10YR 4.5/3, moist) fine sand; same as above except seemingly a fraction lighter-colored. |

OIL TYPE Valentine LOCATION Cherry County, Nebraska
 fine sand

SOIL NOS. S54Nebr-16-1-(1-5) LAB. NOS. 2441-2444

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									TEXTURAL CLASS	
		1B1b					3A1					2A2
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02			0.02-0.002
0-4	A1	0.2b	4.2	12.7	50.2	24.7	4.1	3.9	61.0	1.8	-	fs
4-10	AC	0.1	4.6	13.3	55.1	21.6	2.2	3.1	60.7	0.8	-	fs
10-18	C1	-	3.6	11.2	56.2	24.0	1.8	3.2	64.3	1.7	-	fs
18-32	C2	-	4.4	18.6	58.9	14.7	1.0	2.4	51.0	0.3	-	fs
32-54	C3	0.1	3.8	10.9	59.1	22.1	1.3	2.9	64.4	0.6	-	fs
8C1b SATURATED PASTE	pH		ORGANIC MATTER			ESTR. SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC · 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv- alent %	GYPSUM mg./100g. SOIL	MOISTURE TENSIONS		
	1:5	1:10	6A1a ORGANIC CARBON %	6B1a NITRO- GEN %	C/N					1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
6.0	6.4	6.5	0.98	.092	10.6				9.8	5.8	4.0	
6.2	6.6	6.6	0.46	.040	11.5				6.2	3.7	2.5	
6.5	6.7	6.6	0.22	.021					5.6	3.1	2.0	
6.7	6.9	6.7	0.09						3.6	2.1	1.4	
6.8	7.0	6.9	0.07						4.8	2.7	1.6	
5A1a CATION EXCHANGE CAPACITY NH ₄ , Ac 4	EXTRACTABLE CATIONS					BASE SAT. %	Na	K	5A3a Sum Cations mg/100g	8D3 Ca/Mg	MOISTURE AT SATU- RATION %	
	6E2b Ca	6O2b Mg	H	6P2a Na	6Q2a K							5C1 milliequivalents per 100g. soil
5.9	3.6	0.6		0.1	0.3	78			4.5	6.0		
3.7	2.1	0.4		0.1	0.3	78			2.9	3.2		
3.3	2.0	0.6		0.1	0.2	88			2.9	3.3		
2.4	1.5	0.2		0.1	0.1	79			1.9	7.5		
2.8	1.8	0.8		0.1	0.2	100			2.9	2.2		

a. Particle size analyses by Beltsville Laboratory.
 b. Organic matter in sand fractions.

Soil type: Valentine fine sand
 Soil No.: S54Nebr-16-1-(1-5)
 Location: 250 feet south and 270 feet east of point where road crosses section line; north side Sec. 25, T26N, R23W; on U. S. Highway 83, 16.4 miles north of junction with Nebraska Highway 2, east of Thedford, Cherry County, Nebraska.
 Topography: On short northwest facing slope of about 10 percent gradient. Farmstead and grove of trees .5 mile to the northwest in a "dry" valley.
 Described by: B. H. Williams.

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|----------------|--------|---|
| 2440 | A ₁ | 0-4" | Dark grayish brown (10YR 4/2, dry) to very dark brown (10YR 2.5/2, moist) fine sand. Single grained; soft, dry with sufficient coherence to break into soft lumps; loose, moist; clear smooth boundary. |
| 2441 | AC | 4-10" | Brown (10YR 5/2.5, dry) to dark grayish brown (10YR 4/2, moist) fine sand. Single grained, soft, dry with sufficient coherence to form soft lumps; loose, moist; clear smooth boundary. |
| 2442 | C ₁ | 10-18" | Pale brown (10YR 6/3, dry) to dark brown (10YR 4/3, moist) fine sand, single grained; soft, dry; loose, moist; gradual smooth boundary. |
| 2443 | C ₂ | 18-32" | Light gray (10YR 7/2, dry) to grayish brown (10YR 5.5/2, moist) fine sand. Similar to above with slightly lighter and grayer colors. |
| 2444 | C ₃ | 32-54" | Light brownish gray (10YR 6/2.5, dry) to grayish brown (10YR 5/2.5, moist) fine sand; single grained; soft, dry, loose and very friable, moist. Seems to differ from the horizon above mainly or only in that there are two dark yellowish brown (moist) irregularly wavy thin seams or lenses (10YR 6/3, dry; 4.5/3, moist) of slightly clayey sand, probably loamy fine sand in this horizon. The upper lense was about 1/4-inch thick, the lower one about 1/2-to 3/4-inches thick. This material has a slightly firm moist consistence. |

SOIL SURVEY LABORATORY

Mandan, N. Dak. a/

9/20/55

SOIL TYPE Valentine
fine sand

LOCATION Cherry County, Nebraska

SOIL NOS.

S54Nebr-16-2-(1-5)

LAB. NOS.

2445-2449

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		3A1											
		1B1b VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	2A2 > 2		
0-4	A1	-	1.9	10.5	59.9	18.6	4.3	4.8	61.7	1.5	-	fs	
4-8	AC	0.1	2.5	10.4	57.3	21.5	3.1	5.1	63.6	1.2	-	fs	
8-16	C1	0.1	2.8	8.2	63.3	19.3	1.0	5.3	66.3	0.4	-	fs	
16-39	C2	-	1.5	11.7	64.1	16.8	0.8	5.1	61.4	0.3	-	fs	
39-60	C3	-	1.3	18.6	70.4	6.5	0.6	2.6	41.6	0.2	-	fs	
		pH		ORGANIC MATTER			ESTD. SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM	CoCO ₃ equivalent %	GYPSUM mo./100g. SOIL	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITRO-GEN %	C/N	4B1a 1/10 ATMOS. %					4B1a 1/3 ATMOS. %	4B2 15 ATMOS. %	
6.2	6.6	6.6	0.90	.078	11.5					9.8	5.6	3.3	
6.6	6.9	6.7	0.52	.045	11.6					7.5	4.9	3.0	
6.6	7.1	6.9	0.24	.021						6.5	4.3	2.6	
6.8	7.1	6.9	0.11							6.8	4.4	2.4	
6.7	7.1	6.7	0.06							3.4	2.1	1.3	
5A1a CATION EXCHANGE CAPACITY NH ₄ Ac		EXTRACTABLE CATIONS					5B1a BASE SAT. %			5A3a Sum Cations me/100g	8D3 Ca/Mg	MOISTURE AT SATURATION %	
6N2b Ca		6O2b Mg		H	6P2a Na	6Q2a K							
		milliequivalents per 100g. soil					5C1						
6.1	4.1	0.8			0.1	0.3	87		5.3	5.1			
5.4	3.7	0.6			0.1	0.3	87		4.7	6.2			
4.6	3.2	0.9			0.1	0.3	98		4.5	3.5			
4.3	2.8	0.6			0.1	0.3	88		3.8	4.7			
2.3	1.5	0.5			0.1	0.2	100		2.3	3.0			

a. Particle size analyses by Beltsville Laboratory.

Soil type: Valentine fine sand

Soil No.: S54Nebr-16-2-(1-5)

Location: Near northeast corner of southeast quarter of northeast quarter, Sec. 23, T27N, R28W; 230 feet west and 50 feet south of fence corner that is located 480 feet west of Highway 83 adjacent to ranch road, (Richardson Ranch) leading west .9 mile north of Brownlee road junction with Highway 83. 23.1 miles north on U. S. Highway 83, from its junction with Nebraska Highway 2, east of Theford, Cherry County, Nebraska.

Topography: West facing slope of undulating and gently rolling area lying south and east of broad irregularly shaped valley; a large farmstead spread about .5 mile north of location.

Described by: B. H. Willians.

Mandan

Lab.

No. Horizon Depth

- | | | | |
|------|----------------|--------|--|
| 2445 | A ₁ | 0-4" | Dark grayish brown (10YR 4/2, dry) to very dark grayish brown (10YR 3/2, moist) fine sand; single grained; soft, dry; very friable, moist; clear smooth lower boundary. |
| 2446 | AC | 4-8" | Brown (10YR 5/3, dry) to dark grayish brown (10YR 4/2, moist) fine sand; single grained; slightly hard, slight resistance to digging, when dry; loose friable, moist; clear smooth lower boundary. |
| 2447 | C ₁ | 8-16" | Brown (10YR 5.5/3, dry) to brown (10YR 5/3, moist) fine sand; single grained; slightly hard, resistant to digging, when dry; loose friable moist; diffused lower boundary. |
| 2448 | C ₂ | 16-39" | Pale brown (10YR 6/3, dry) to brown (10YR ^R 5/2.5, moist) fine sand; single grained; soft, dry; loose friable, moist; abrupt smooth lower boundary. |
| 2449 | C ₃ | 39-60" | Light brownish gray (10YR 6/2.5 dry) to grayish brown (10YR 5/2.5, moist) fine sand; single grained; soft, dry; very friable, moist. This horizon is slightly darker than the one above, apparently accumulated gradually under vegetation allowing some darkening of the material as it was deposited. On the other hand, it could represent dark surface material blown from the adjacent lower slopes or the nearby valley. |

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Volin LOCATION Saunders County, Nebraska
very fine sandy loam

SOIL NOS. 853Nebr-78-2-(1-8) LAB. NOS. 1482-1489

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									2A2 > 2	TEXTURAL CLASS
		1B1a		3A1								
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002		
0-6	A1p	-	-	0.2	1.3	19.3	65.3	13.9	17.2	14.4	-	sil
6-11	A12	-	-	0.2	1.2	23.8	59.6	15.2	69.7	14.6	-	sil
11-15	AC	-	-	-	0.6	22.8	63.6	13.0	72.3	14.6	-	sil
15-24	C1	-	-	-	0.5	18.7	68.2	12.6	72.1	15.2	-	sil
24-32	C2	-	-	0.2	0.8	20.0	70.4	8.5	81.4	9.4	-	sil
32-39	Cca	0.4	0.3	0.1	-	6.8	74.5	17.7	57.9	23.4	-	sil
39-48	C3	-	-	-	0.9	51.8	42.0	5.3	90.4	4.1	-	vfs1
48-66	C4	0.5	0.3	-	-	2.4	76.8	20.0	39.6	39.6	-	sil

8C1b SATU- RATED PASTE	pH		ORGANIC MATTER		8A2 EST% SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	6E1a CaCO ₃ equiv- alent %	6F1a GYPSUM me./100g. SOIL	MOISTURE TENSIONS		4B2 15 ATMOS. %
	8C1a	8C1a	6A1a	6A1a					1/10 ATMOS. %	1/3 ATMOS. %	
	1:5	1:10	ORGANIC CARBON %	NITRO- GEN C/N %							
6.1	6.5	6.5	1.34		a	0.6				8.4	
5.9	6.3	6.4	1.49			0.5				9.2	
5.9	6.3	6.4	0.85			0.4				8.3	
6.1	6.5	6.5	0.43			0.4	-			7.6	
7.0	7.1	7.1	0.27			0.5	-			6.0	
7.8	8.1	8.3	0.33			0.6	3			10.8	
7.9	8.2	8.3	0.08			0.7	1			4.0	
7.7	8.2	8.3	0.47			0.7	2			12.5	

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	5B1a CATIONS				5B1b	5D2 EXCH. No %	8A1 SATURATION EXTRACT SOL.		8D3 Ca/Mg	8A MOISTURE AT SATU- RATION %
	EXTRACTABLE		EXCHANGEABLE				6P1a No	6Q1a K		
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K			← milliequivalents per liter →			
16.9	12.0	3.4		0.2	1.3	1	0.2	1.0	3.5	41.9
18.4	13.4	3.6		0.4	0.9	2	0.2	0.5	3.7	45.3
15.5	11.5	3.1		0.2	0.3	1	0.4	0.1	3.7	46.4
14.2	10.9	3.2		0.2	0.3	1	0.4	0.1	3.4	43.4
11.2	9.5	2.5		0.2	0.4	2	0.4	0.1	3.8	41.4
18.7		4.2		0.2	0.7	1	0.4	0.1		45.6
7.5		2.1		0.2	0.2	3	1.5	0.1		36.3
21.9				0.4	0.7	2	1.3	0.1		48.6

a. Less than 0.20%.

Soil type: Volin very fine sandy loam

Soil No.: 853Nebr-78-2-(1-8)

Location: One-fourth mile south and 100 feet west of NE corner Sec. 26, T13N, R9E, Saunders County, Nebraska

Topographic position: Flatte River bottom land above flood level of the river but may be occasionally flooded by local drains.

Relief: Slight, on slightly elevated position with respect to surrounding area.

Drainage: Moderately well drained to well drained.

Ground water: Below 6 feet, probably 8 to 10 feet below the surface but is known to fluctuate to about 5 feet below the surface in some years.

Land use: Cultivated. Capable of producing high yields of corn and alfalfa.

Described by: B. H. Williams and Donald C. Yost.

Mandan

Lab. No. Horizon

1482	Alp	0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) very fine sandy loam; weak thick platy breaking to moderate fine granular; soft, dry; friable, moist; noncalcareous; abrupt smooth lower boundary.
1483	A12	6-11 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; weak coarse subangular blocky breaking to strong fine granular; slightly hard, dry; friable, moist; non-calcareous; many fine and medium pores and openings; clear smooth lower boundary.
1484	AC	11-15 inches. Grayish brown and light brownish gray (10YR 5/2 and 6/2 dry) to dark gray and grayish brown (10YR 4/2 and 5/2 moist) silt loam soil from horizons above and below mixed by worms in about equal amounts of the lighter and darker colors; moderate coarse subangular blocky breaking to strong medium and fine granular; slightly hard, dry; friable, moist; numerous fine pores and openings; noncalcareous. Smooth clear lower boundary.
1485	C1	15-24 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) silt loam; massive, but separates into weak fine granular or crumb-like particles; soft, dry; very friable, moist; many fine pores and openings; noncalcareous; clear smooth lower boundary.
1486	C2	24-32 inches. Light gray or nearly white (2.5Y 7.5/2 dry) to grayish brown (2.5Y 5/2 moist) very fine sandy loam; massive, soft, dry; very friable, moist; many medium and fine pores and openings; noncalcareous, pH 7.5 (Soiltax); clear smooth lower boundary.
1487	Cca	32-39 inches. Light gray or nearly white (2.5Y 7.5/2 dry) to grayish brown (2.5Y 5/2 moist) silt loam, dark grayish brown (2.5Y 4/2 moist) containing some worm casts and a few coarse brown mottles; massive; soft, dry; very friable, moist; many medium and fine pores and openings; violent effervescence, pH 7.5, numerous fine white streaks and spots of lime; clear smooth lower boundary.
1488	C3	39-48 inches. Light gray or nearly white (2.5Y 7.5/2 dry) to light brownish gray (2.5Y 6/2 moist) loamy very fine sand, common faint fine and coarse brown mottles and very thin dark-colored lenses; massive, soft, dry; very friable, moist; weak effervescence, pH 7.5; gradual smooth lower boundary.
1489	C4	48-66 inches. Light gray (10YR 7/1 dry) to gray (10YR 5/1 moist) silt loam and sandy loam, stratified with very thin lenses of nearly white very fine sandy loam and nearly black silty clay loam; massive; soft, dry; very friable, moist; weak effervescence, pH 7.5; clear smooth lower boundary.
	Alb	66-70+ inches. This horizon not sampled for laboratory analysis. Very dark gray or nearly black silty clay loam.

SOIL TYPE Webash LOCATION Pawnee County, Nebraska
silty clay loam

SOIL NOS. S58Nebr-67-4-(1-6) LAB. NOS. 9156-9161

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									2A2 > 2	TEXTURAL CLASS
		1A1a		3A1								
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002		
0-5	Alp	<0.1	0.3a	0.4a	0.9b	1.3b	65.2	31.9	31.2	35.8	-	sic1
5-11	Al2	0.1a	0.4a	0.4a	0.8b	1.0b	62.3	35.0	26.5	37.2	-	sic1
11-22	Al3	0.3a	0.4a	0.4a	0.5b	0.9b	58.3	39.2	22.8	36.7	-	sic1
22-35	A3	0.2a	0.2a	0.2a	0.6b	0.8b	54.3	43.7	19.4	36.1	-	sic
35-48	C1	0.4a	0.2a	0.1a	0.4b	0.5b	49.7	48.7	14.0	36.5	-	sic
48-63	C2	0.1a	0.2a	0.2a	0.6b	0.7b	50.7	47.5	14.5	37.3	-	sic

pH	ORGANIC MATTER			6C1a	ELECTRICAL CONDUCTIVITY	6E1a	MOISTURE TENSIONS			
	8C1a	6A1a	6B1a	Free Iron as %Fe ₂ O ₃	EC x 10 ³ MILLIMHOS PER CM 8A1a	CaCO ₃ equiv- alent	CYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
		1:5	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N	%	me./100g. SOIL	%	%
1.1										
5.9			2.31	0.157	14.7	0.8	0.3			14.1
6.0			1.86	0.119	15.6	0.8	0.3			16.1
6.1			1.09	0.074	14.7	0.8	0.3			18.5
6.4			0.73	0.051	14	0.8	0.3			20.4
6.9			0.49			0.7	0.4	<		21.2
7.2			0.35			0.7	0.4	<		20.7

5A1a	EXTRACTABLE CATIONS 5B1a					BASE SAT. % NH ₄ Ac EXCH.	8A1 SAT. EXT. SOL.		4B4	4A1a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a		6F1a	6Q1a	Field State Water	Vol. Wt.	MOISTURE AT SATURATION
	Ca	Mg	H	Na	K		Na	K	%	g/cc	%
	milliequivalents per 100g. soil					5C1	me. per liter-->				
27.2	21.6	4.4	7.3	0.1	0.4	97	0.3	0.1			55.4
28.3	23.9	5.1	6.2	0.1	0.4	104	0.6	0.1			57.5
30.3	24.5	6.2	5.8	0.3	0.5	104	0.8	0.1	27.5	1.44	74.1
30.9	26.6	6.7	4.2	0.5	0.7	112	1.0	0.1			80.9
33.2	27.9	7.5	2.5	0.5	0.7	110	1.2	0.1			87.0
32.5		7.3	1.7	0.7	0.9		1.2	0.1	29.0	1.45	89.8

a. Many smooth dark brown to black conr. (Fe-Mn?)
b. Common smooth dark brown to black conr. (Fe-Mn?)

Soil Type: Wabash silty clay loam

Classification: Alluvial

Location: 150 feet south and 0.2 mile east of center of Sec. 11, T1N, R11E, located about 3 miles south of Pawnee City, Pawnee County, Nebraska.

Date Sampled: September 12, 1958.

Collectors: R. Jordan, R. Greenawalt.

Use: Cultivated (corn 1958).

Climate: Average annual precipitation 31 inches; average annual temperature 53° F.

Parent Material: Alluvium.

Physiography: Bottom land.

Slope: Less than 1 percent.

Drainage: Slow.

Ground Water: Below 5 feet.

Soil No.: S58Nebr-67-4-(1-6)

Lincoln

Lab.No. Horizon

- | | | |
|------|-----|--|
| 9156 | Alp | 0-5 inches. Very dark gray (10YR 3/1 dry) to black (10YR 2/1 moist) silty clay loam; moderate and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary. |
| 9157 | Al2 | 5-11 inches. Very dark gray (10YR 3/1 dry) to black (2.5Y 2/0 moist) heavy silty clay loam; moderate medium and fine granular structure; slightly hard dry, friable moist; noncalcareous; gradual smooth lower boundary. |
| 9158 | Al3 | 11-22 inches. Very dark gray (10YR 3/1 dry) to black (2.5Y 2/0 moist) silty clay; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary. |
| 9159 | A3 | 22-35 inches. Black (10YR 2/1 dry) to black (2.5Y 2/0 moist) silty clay; weak medium and fine blocky structure with clay films on the aggregate faces; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary. |
| 9160 | C1 | 35-48 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay; weak coarse blocky structure with clay films and the sides of the blocks are slicked at a 45° angle; very hard dry, very firm moist; noncalcareous; gradual smooth lower boundary. |
| 9161 | C2 | 48-63 inches. Dark gray (10YR 4/1 dry) to very dark grayish brown (10YR 3/2 moist) silty clay; weak coarse blocky structure with clay films and the sides of the blocks are slicked at a 45° angle; very hard dry, very firm moist; noncalcareous but with a few medium hard lime concretions. |

Note: Horizons Alp, Al3 and C2 were sampled for the Bureau of Public Roads.

SOIL TYPE Wabash LOCATION Pawnee County, Nebraska
silty clay loam

SOIL NOS. S58Nebr-67-8-(1-7) LAB. NOS. 9185-9191

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)									2A2 > 2	TEXTURAL CLASS
		1B1a		3A1								
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002		
0-7	A1p	0.1	0.3	0.5	1.3a	1.5a	62.7	33.6	28.6	36.3	-	sic1
7-13	A12	<0.1	0.2b	0.4b	1.1b	1.3c	62.7	34.3	26.4	38.2	-	sic1
13-22	A13	<0.1	0.1b	0.3b	0.6b	0.7c	50.1	48.2	15.9	35.2	-	sic
22-36	A14	0.1b	0.2b	0.1b	0.3b	0.5c	49.2	49.6	15.2	34.7	-	sic
36-44	A31	<0.1	0.1b	0.1b	0.2b	0.4c	52.2	47.0	16.0	36.7	-	sic
44-52	A32	0.1b	0.2b	0.1b	0.2b	0.5c	50.1	48.8	17.4	33.3	-	sic
52-60	C	<0.1	0.4d	0.4d	0.6d	0.4e	49.0	49.2	15.4	34.3	-	sic

pH	ORGANIC MATTER			6C1a Free Iron as %Fe ₂ O ₃	ELECTRI-CAL CONDUCTIVITY EC x 10 ³ PER CM	6E1a CaCO ₃ equiv- alent	MOISTURE TENSIONS		
	6A1a ORGANIC CARBON	6B1a NITRO-GEN	C/N				4E2 15 ATMOS.		
	%	%	%				%		
1:1	1:5	1:10							
6.2			2.27	0.173	13.1	1.0	0.4		14.5
6.0			2.12	0.158	13.4	0.8	0.3		15.5
5.6			1.38	0.107	12.9	0.8	0.3		21.1
5.7			0.84	0.056	15	0.7	0.3		21.8
6.4			0.63			0.5	0.3		20.4
6.8			0.43			0.6	0.5	< 1	20.6
7.5			0.35			0.6	1.1	2	21.0

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5B1a BASE SAT. % NH ₄ Ac EXCH.	6A1 SAT. EXT. SOL.		4A1a Vol. Wt. g/cc	3A MOISTURE AT SATU-RATION %
	6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K		6P1a Na	6Q1a K		
	milliequivalents per 100g. soil						5C1 ← me. per liter →			
27.2	21.8	4.3	6.9	<0.1	0.7	98	0.4	0.2		60.2
28.6	22.0	4.7	7.3	0.1	0.4	95	0.4	0.1		63.6
35.8	26.5	6.2	9.5	0.4	0.6	94	0.5	0.1		79.6
35.8	28.2	7.0	7.1	0.2	0.7	101	0.4	0.1		91.5
34.9	28.7	6.7	3.3	0.3	0.7	104	0.7	0.1		84.6
35.4	30.5	7.0	2.9	0.3	0.8	109	0.8	0.1	1.40	88.0
34.8		6.4	0.8	0.3	0.8		1.2	0.1		89.7

a. Few smooth light brown to black concr. (Fe-Mn?)
 b. Many smooth light brown to black concr. (Fe-Mn?)
 c. Common smooth light brown to black concr. (Fe-Mn?)
 d. Common smooth light brown to black concr. (Fe-Mn?); few CaCO₃ concr.
 e. Few smooth light brown to black concr. (Fe-Mn?); few CaCO₃ concr.

Soil Type: Wabash silty clay loam
 Classification: Alluvial
 Location: 500 feet east and 160 feet south of center of Sec. 21, T2N, R11E, located about 2 miles west and 1 mile north of Pawnee City, Pawnee County, Nebraska.
 Date Sampled: September 16, 1958.
 Collectors: J. Allen, J. Elder, R. Greenawalt.
 Use: Cultivated (red clover).
 Climate: Average annual precipitation 31 inches; average annual temperature 53° F.
 Parent Material: Alluvium.
 Physiography: Bottom land.
 Drainage: Slow.
 Slope: Less than 1 percent.
 Ground Water: Deeper than 5 feet.
 Soil No.: S58Nebr-67-8-(1-7)

Lincoln

Lab.No. Horizon

9185	Alp	0-7 inches. Very dark brown (10YR 2/2 dry) to very dark brown (10YR 2/2 moist) silty clay loam; moderate fine and very fine granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9186	Al2	7-13 inches. Very dark gray (2.5Y 3/0 dry) to black (2.5Y 2/0 moist) silty clay loam; moderate fine granular structure; slightly hard dry, friable moist; noncalcareous; gradual smooth lower boundary.
9187	Al3	13-22 inches. Very dark gray (2.5Y 3/0 dry) to black (10YR 2/1 moist) silty clay; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9188	Al4	22-36 inches. Very dark gray (10YR 3/1 dry) to black (10YR 2/1 moist) silty clay; moderate medium and fine blocky structure; some of the blocks are slicked; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9189	A31	36-44 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silty clay; moderate coarse blocky structure; the sides of the blocks are slicked and at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9190	A32	44-52 inches. Dark gray (5Y 4/1 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay; moderate coarse blocky structure; the sides of the blocks are slicked at a 45° angle; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9191	C	52-60 inches. Dark gray (5Y 4/1 dry) to very dark grayish brown (2.5Y 3/2 moist) silty clay; moderate coarse blocky structure; the sides of the blocks are slicked at a 45° angle; hard dry, firm moist; calcareous.

Note: Horizons Alp, Al3 and C were sampled for the Bureau of Public Roads.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Wann silt loam LOCATION Hall County, Nebraska

SOIL NOS. S53Nebr-40-3-(1-5) LAB. NOS. 1566-1570

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS									
		1B1a		2A1					2A2												
		VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (19mm)										
0-6	A1p	4.0	11.4	10.2	11.1	13.7	35.5	14.1	45.7	8.5	1	1									
6-15	A12	9.1	17.7	15.7	15.8	8.3	20.8	12.6	30.6	5.3	4	cosl									
15-20	A13	8.5	20.6	18.2	17.9	8.0	16.2	10.6	27.4	4.7	3	cosl									
20-27	AC	10.3	20.6	19.3	20.6	7.5	13.2	8.5	26.1	3.9	2	cosl									
27-32	C	24.6	26.2	17.8	17.0	4.6	5.3	4.5	15.3	1.1	8	cos									
pH		ORGANIC MATTER			8A2	ELECTRI- CAL CONDUCT- IVITY EC x 10 ³ MILLIMHOES PER CM 8A1a	6B1a	6F1a	MOISTURE TENSIONS												
8C1b SATU- RATED PASTE	8C1a	8C1a	6A1a	ORGANIC CARBON %	NITRO- GEN %	C/N	EST% SALT (BUREAU CUP)	CoCO ₂ equiv- alent %	GYPSUM mo./100g SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %									
8.1	8.4	8.5	1.25			a	1.1	2				7.6									
8.4	8.8	8.9	0.76				1.0	4				7.1									
8.5	8.9	9.0	0.37				0.9	2				6.3									
8.0	8.2	7.7	0.14				0.8	1	-			4.7									
8.0	7.4	7.0	0.07				0.7	-	-			2.2									
5A1a	5B1a	CATIONS			5B1b	5D2	SATURATION EXTRACT SOL.			8A											
CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE		EXCHANGEABLE		EXCH. No %	6P1a	6Q1a			MOISTURE AT SATU- RATION %											
	Ca	Mg	Na	K		No	K														
← milliequivalents per 100g. soil →											← milliequivalents per liter →										
13.9			0.4	1.0	3	3.0	0.8			35.9											
9.7			0.7	0.4	7	6.7	0.1			32.0											
8.2			1.0	0.2	12	7.4	0.1			28.4											
7.0			0.7	0.2	10	6.7	-			23.6											
3.4			0.3	0.1	9	5.2	-			19.5											

a. Less than 0.20%.

Soil type: Wann silt loam

Soil No.: S53Nebr-40-3-(1-6)

Location: One hundred and fifty feet northeast of south 1/4 corner Sec. 1, T10N, R10W, Hall County, Nebraska

Topographic position: Nearly level Platte River bottom land above overflow.

Drainage: Moderately well drained.

Use: Cultivated. Corn, 1952.

Described by: B. H. Williams and Donald C. Yost.

Mandan

Lab. No.	Horizon	Description
1566	Alp	0-6 inches. Dark gray (10YR 4/1 dry) to very dark gray (10YR 3/1 moist) silt loam; moderate fine and very fine granular; soft, dry; friable, moist; strong effervescence; abrupt smooth lower boundary.
1567	A12	6-15 inches. Very dark gray (10YR 3.5/1 dry) to nearly black (10YR 2.5/1 moist) silt loam or loam; containing a few fine gravel; strong fine and very fine granular; soft, dry; friable, moist; violent effervescence; clear smooth lower boundary.
1568	A13	15-20 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) loam; containing a few fine gravel, moderate fine granular; soft, dry; friable, moist; violent effervescence; clear smooth lower boundary.
1569	AC	20-27 inches. Gray (10YR 5/1.5 dry) to dark gray (10YR 4/1 moist) fine sand loam; moderate fine granular; soft, dry; very friable, moist; weak effervescence in upper part; clear smooth lower boundary.
1570	C	27-32 inches. Light brownish gray (10YR 6/2 dry) to grayish brown (10YR 5/2 moist) loamy sand; single grained, loose, noncalcareous; gradual wavy lower boundary.
	D	32-40+ inches. Not sampled for Mandan laboratory. Very pale brown sand and fine gravel; loose, noncalcareous; water table at about 60 inches. At about 60 inches plus is a horizon with prominent brown mottlings. Little or no mottling above 60 inches to indicate restriction in drainage above the water table.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Wann LOCATION Hall County, Nebraska
silt loam

SOIL NOS. S53Nebr-40-2-(1-6) LAB. NOS. 1560-1565

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a	3A1					2A2				
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	> 2	
		2.1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002	(1.9mm)	
0-7	A1p	2.6	7.1	7.2	12.4	20.7	35.1	14.9	54.3	8.3	Tr.	1
7-12	A12	2.6	8.6	8.4	15.3	19.3	32.7	13.1	53.7	6.8	1	fs1
12-17	A13	7.2	13.0	10.2	15.4	22.8	24.7	6.7	50.6	5.0	2	sl
17-21	C1	4.3	9.0	8.9	16.6	28.8	26.2	6.2	60.1	4.4	1	fs1
21-27	C2	5.7	11.2	10.1	15.4	32.4	20.5	4.7	57.9	3.4	2	ls
27-35	D	25.5	29.6	19.2	15.7	5.3	3.5	1.2	14.9	0.4	6	cos
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
8C1b	8C1a	8C1a	6A1a			EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM @ 25°C	CoCO ₂ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4E2
SATURATED PASTE	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N			%		%	%	15 ATMOS. %
8.1	8.7	9.0	1.19			a	1.2	5				8.5
8.3	8.7	8.9	0.91				1.1	5				7.3
8.2	8.6	8.8	0.34				1.0	2				4.9
7.9	7.7	7.6	0.17				0.9	1	-			4.1
7.8	7.5	7.2	0.07				0.9	1	-			3.2
8.0	7.0	6.8	0.03				1.3	1	-			1.3
5A1a	5B1a	CATIONS		5B1b		5D2	SATURATION EXTRACT SOL.			8A		
CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE		EXCHANGEABLE		EXCH. %	6P1a	6Q1a			MOISTURE AT SATURATION		
	Ca	6O2b Mg	6P2a Na	6Q2a K		No	K	← milliequivalents per liter →		%		
	← milliequivalents per 100g. soil →											
12.7			0.6	1.3	5	5.9	1.2			36.9		
11.1			0.7	0.8	6	6.5	0.5			33.7		
7.4			0.4	0.3	5	6.1	0.1			29.9		
7.4		2.2	0.4	0.2	5	5.6	0.1			30.3		
5.6		1.6	0.4	0.2	7	5.0	0.1			27.5		
2.2			0.1	0.1	4	6.7	0.1			20.7		

a. Less than 0.20%.

Soil type: Wann silt loam
 Soil No.: S53Nebr-40-2-(1-6)
 Location: 0.1 mile north of east 1/4 corner Sec. 8, T10N, R9W, Hall County, Nebraska.
 Topographic position: Broad, slightly depressed flat of broadly undulating Flatte River bottom land above overflow.
 Drainage: Poorly drained.
 Use: Cultivated. Corn, 1952.
 Described by: B. H. Williams and Donald C. Yost.

Mandan		
Lab.No.	Horizon	
1560	Alp	0-7 inches. Gray (10YR 5.5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; violent effervescence, pH 8.5 (Soiltex); few coarse sand grains; abrupt smooth lower boundary.
1561	Al2	7-12 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; many fine and medium pores and openings; violent effervescence; clear smooth lower boundary.
1562	Al3	12-17 inches. Gray (10YR 5.5/1 dry) to very dark gray (10YR 3/1 moist) loam; weak medium and fine granular; slightly hard, dry; friable, moist; strong effervescence, pH 8.5 (Soiltex); clear smooth lower boundary.
1563	C1	17-21 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; massive or weak fine granular; soft, dry; very friable, moist; no effervescence, pH 7.2; gradual smooth lower boundary.
1564	C2	21-27 inches. Light brownish gray (10YR 6/2 dry) to grayish brown (10YR 5/2 moist) loamy fine sand or fine sandy loam; common faint fine yellowish brown mottles; massive; soft, dry; very friable, moist; noncalcareous, pH 7.0; gradual smooth lower boundary.
1565	D	27-35 inches. Light brownish gray (10YR 6/2.5 dry) to pale brown (10YR 6/3 moist) loamy sand or sand; massive, loose, noncalcareous, graded mixture largely fine sand to fine gravel with a little silt and clay; many prominent coarse brown and yellowish brown mottles; gradual smooth lower boundary.
		35+ inches. Not sampled for laboratory study. Pale brown sand and fine gravel; mottled and stained with iron, saturated, water table at 40 inches.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Wann LOCATION Hall County, Nebraska
 silt loam

SOIL NOS. 853Nebr-40-6-(1-5) LAB. NOS. 1586-1590

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a					3A1						2A2
		VERY COARSE SAND 2.1	COARSE SAND 1.0-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002					> 2 < 19mm
0-9	Alp	0.5	2.9	3.9	9.4	16.6	43.7	23.0	54.3	11.2	-	1	
9-14	Al2	1.1	5.0	5.9	16.6	18.5	33.8	19.1	54.5	7.7	Tr.	1	
14-19	AC	1.3	5.1	7.0	24.8	20.7	28.8	12.3	58.4	7.1	Tr.	fs1	
19-22	Cl	0.9	2.8	4.3	29.3	26.4	26.9	9.4	67.6	6.5	Tr.	fs1	
22-28	C2	0.7	4.5	6.6	17.6	25.0	34.9	10.7	63.2	7.5	Tr.	vs1	
pH		ORGANIC MATTER					8A2	ELECTRI-CAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		4B2
8C1b SATURATED PASTE		8C1a	8C1a	6A1a	6A1a	6A1a	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM @ 25°C	CoCO ₃ equivalent %	GYP SUM mg./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:5		1:10	ORGANIC CARBON %	NITRO-GEN %	C/N								
8.0	8.6	8.8	1.62			a	3.9	7					12.0
8.0	8.5	8.6	0.69				2.0	6					9.0
7.9	8.4	8.5	0.25				1.2	1					6.2
7.8	7.8	7.7	0.14				0.9	1	-				4.6
7.4	7.3	7.2	0.10				0.8	-	-				4.4
5A1a	5B1a	CATIONS				5B1b	5D	SAL SATURATION EXTRACT SOL.				8A	
CATION EXCHANGE CAPACITY NE, Ac	EXTRACTABLE		EXCHANGEABLE				6P1a	6Q1a			MOISTURE AT SATURATION %		
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K	EXCH. No %								
←		milliequivalents per 100g. soil →					←		milliequivalents per liter →				
17.9		7.8	2.7	1.2	15	30.0	0.8			49.8			
12.8			1.4	0.6	11	13.0	0.1			44.9			
10.3		3.7	0.7	0.4	7	6.1	0.1			36.7			
8.4		2.8	0.5	0.4	6	3.3	0.1			34.3			
8.5	6.0	2.6	0.4	0.4	5	2.6	0.1			37.4			

a. Less than 0.20%.

Soil type: Mann silt loam

Soil No.: S53Nebr-40-6-(1-5)

Location: One-fourth mile north of SW corner Sec. 36, T10N, R11W, Hall County, Nebraska.

Topographic position: Nearly level Platte River bottom land.

Relief: Slight.

Drainage: Imperfectly drained; water table at 4 feet or less and probably fluctuates between 30 and 50 inches.

Use: Cultivated.

Described by: B. H. Williams and Donald C. Yost.

Mandan

Lab. No.	Horizon	Description
1586	Alp	0-9 inches. Gray (10YR 5.5/1 dry) to very dark gray or dark gray (10YR 3.5/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; violent effervescence, pH 8.7 (Soiltex); abrupt smooth lower boundary.
1587	A12	9-14 inches. Gray (10YR 5.5/1 dry) to very dark gray (10YR 3.5/1 moist) silt loam; strong fine granular; slightly hard, dry; friable, moist; many fine and very fine pores and root channels; violent effervescence, pH 8.5; clear smooth lower boundary.
1588	AC	14-19 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; few faint fine yellowish brown mottles; strong fine granular; soft, dry; friable, moist; weak effervescence, pH 8.0; clear smooth lower boundary.
1589	C1	19-22 inches. Light brownish gray (10YR 6/2.5 dry) to dark grayish brown (10YR 4.5/2 moist) fine sandy loam; few faint fine brown mottles and stains; weak coarse subangular blocky separating to moderate medium and fine granular or crumb; soft, dry; friable, moist; noncalcareous; clear smooth lower boundary.
1590	C2	22-28 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/4 moist) fine sandy loam; many distinct fine and coarse dark brown mottles and stains; massive; soft, dry; very friable, moist; noncalcareous, pH 7.0.
		28-30 inches. Not sampled. Transition from C2 to D horizon.
	D	30+ inches. Not sampled. Many soft brown iron concretions and coarse brown mottles and stains above a depth of 4 feet; water table at 46-48 inches.

SOIL SURVEY LABORATORY

SOIL TYPE Wood River silt loam

Mandan, N. Dak.

SOIL NO. S50Nebr-40-2-(1-9)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS						
			1B1a		COARSE SAND		MEDIUM SAND		FINE SAND		VERY FINE SAND			SILT		CLAY		2A2	
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002										
283	0-6	A1p	-	0.4	0.6	1.1	16.3	63.0	18.6	15.9	64.1	-	sil						
284	6-10	A12	-	0.2	0.5	0.9	11.8	68.4	18.2	20.6	60.2	-	sil						
285	10-13	A2	-	0.2	0.5	1.1	14.1	68.6	15.5	21.2	62.2	-	sil						
286	13-21	B21	-	0.2	0.4	0.6	7.7	56.3	34.8	18.1	46.3	-	sic1						
287	21-28	B22	-	-	0.3	0.4	6.1	51.0	42.2	18.6	38.7	-	sic						
288	28-30	B31sa	-	-	0.2	0.3	6.3	51.4	41.8	19.0	38.9	-	sic						
289	30-38	B32	0.2	0.2	0.2	0.4	9.6	54.6	34.8	20.9	43.5	-	sic1						
290	38-53	C1	0.5	0.2	0.1	0.4	11.0	60.0	27.8	23.9	47.2	-	sic1						
291	53-60	C2	2.7	0.9	0.4	0.5	9.4	63.8	22.3	25.8	47.7	-	sic1						
		pH		ORGANIC MATTER			EST. * SALT (BUREAU CUP)		ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM		CaCO ₃ equivalent per cent		GYPSUM me /100g SOIL		MOISTURE TENSIONS (per cent) 1/10 1/3 4.2		ATMOS ATMOS ATMOS		
		SATURATED PASTE 8C1b		1:5 8C1a		1:10 8C1a		% ORGANIC CARBON 6A1a		% NITROGEN		C/N							
283	6.8	7.3	7.4	1.47			-	0.9	tr	-			8.4						
284	7.1	7.6	7.7	1.20			-	0.8	tr	-			7.8						
285	7.3	7.9	8.0	0.90			-	0.7	tr	-			6.4						
286	7.3	8.3	8.5	0.52			-	1.0	tr	-			16.9						
287	8.0	9.0	9.2	0.35			-	1.2	tr	-			22.1						
288	7.7	8.2	8.4	0.24			0.37	4.5	3	2			20.7						
289	8.0	9.2	9.4	0.16			-	1.3	2	-			18.6						
290	7.7	8.9	9.2	0.09			-	1.4	1	-			15.2						
291	7.8	8.9	9.1	0.07			-	1.0	8	-			12.3						
		5A1a CATION		5B1a CATIONS		5B1b		5D2		SATURATION EXTRACT SOLUBLE 8A1						8A PER CENT MOISTURE AT SATURATION			
		EXCHANGE CAPACITY NEq/100g soil		EXTRACTABLE 6N2b Ca Mg		EXCHANGEABLE 6P2a Na K		EXCHANGEABLE SUBM PERCENTAGE ESP		6P1a Na		6Q1a K		CO ₃ HCO ₃ Cl SO ₄					
283	17.9	11.9	3.8	0.8	2.3	5	2.1	3.0								43.1			
284	16.2	12.5	3.1	0.8	1.4	5	2.4	5.3								41.3			
285	13.1	9.3	2.7	1.1	1.6	9	3.7	4.7								38.1			
286	24.9			4.2	3.2	17	9.6	8.8								58.2			
287	32.0			4.8	4.4	15	7.7	5.4								92.0			
288	32.4			2.6	3.8	8	32.5	7.5								77.1			
289	30.2			4.4	4.2	15	10.6	3.2								79.2			
290	27.5			2.4	4.1	9	9.5	3.2								56.8			
291	23.7			1.4	3.4	6	4.6	1.3								47.4			

Soil type: Wood River silt loam
 Soil No.: S50Nabr-40-2-(1-9)
 Location: 1/4 mile north of southwest section corner, northwest quarter of southwest quarter Sec. 19, T10N, R12W, Hall County, Nebraska.
 Topographic position: Terrace along Platte River.
 Drainage: Good, surface and internal.
 Land use: Irrigated corn in 1950.
 Described by: B. H. Williams.
 Date: July 7, 1950.

Horizon and
 Mandan
 Lab. Number

Alp 283	0 to 6 inches. Very dark brown (10YR 2/2 moist), friable silt loam; granular structure.
Al2 284	6 to 10 inches. Very dark brown (10YR 2/2 moist), friable silt loam; blocky and granular structure.
A2 285	10 to 13 inches. Very dark grayish brown (10YR 3/2 moist), friable silt loam; blocky structure; weakly developed gray layer.
B21 286	13 to 21 inches. Very dark brown (10YR 2/3 moist), silty clay; large, blocky primary structure to medium blocky secondary; plastic when wet, moderately hard when dry.
B22 287	21 to 28 inches. Dark grayish brown (2.5Y 4/2 moist), silty clay to silty clay loam; coarse, blocky structure; moderately plastic.
B31sa 288	28 to 30 inches. Light olive brown (2.5Y 5/4 moist), silty clay loam; weak, blocky structure; friable; many streaks of lime or salts, or both.
B32 289	30 to 38 inches. Yellowish brown (10YR 5/4 moist), silt loam; weak blocky structure; friable; calcareous; moderately soft concretions.
C1 290	38 to 53 inches. Light yellowish brown (2.5Y 6/4 moist), silt loam; weak blocky; friable; calcareous, some concretions.
C2 291	53 to 60 inches. Light yellowish brown (2.5Y 6/4 moist), silt loam; massive; friable; stained and mottled; calcareous.

SOIL SURVEY LABORATORY

SOIL TYPE Wood River silt loam

Mandan, North Dakota

SOIL NO. S51Nebr-40-6-(1-6)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
			1B1a		COARSE SAND		MEDIUM SAND		FINE SAND		VERY FINE SAND	SILT	
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	<0.002	0.02-0.002	0.02	> 2 (19mm)	
911	0-11	A1	0.1	0.2	0.3	1.7	15.2	63.2	19.3	18.8	60.6	-	sil
912	11-16	A2	0.2	0.4	0.6	7.1	14.2	61.6	15.9	20.5	59.0	-	sil
913	16-23	B2	-	0.2	0.4	1.0	10.2	46.2	42.0	15.5	41.5	-	sic
914	23-27	B3	0.1	0.1	0.2	0.5	9.3	48.0	41.8	17.2	40.4	-	sic
915	27-42	Bca	0.1	0.1	0.2	0.6	13.1	51.3	34.6	20.2	44.6	-	sic1
916	42-60	C1	1.4	0.8	0.4	1.0	14.2	55.1	27.1	22.3	47.6	3a	sic1-sil
pH			ORGANIC MATTER			EST. % SALT (BUREAU CUR.)		ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equivalent per cent	GYPSUM me./100g SOIL	MOISTURE TENSIONS (per cent) ATMOS.		
SATURATED PASTE		1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N					1/10	1/3	15
8C1b		8C1a	8C1a	6A1a									4B2
5.8	6.3	6.7	2.32				-	0.6	tr	-			11.1
6.3	7.4	7.5	1.19				-	0.7	tr	-			7.4
7.5	8.3	8.6	0.70				-	1.9	tr	-			21.8
8.0	8.7	9.0	0.39				0.22	3.4	tr	-			22.4
7.8	7.9	8.1	0.20				0.38	8.0	2	153			20.6
7.8	8.2	8.5	0.12				0.36	7.5	4	6			16.2
5A1a CATION EXCHANGE CAPACITY -NH ₄ Cl		5B1a CATIONS EXTRACTABLE		5B1b EXCHANGEABLE		5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1						8A PER CENT MOISTURE AT SATURATION
Ca		Mg	Na	K		6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄		
6N2b		6O2b	6P2a	6Q2a				milliequivalents per liter					
19.2	9.4	3.6	0.2	1.6	1	1.3	0.9					51.2	
14.2	6.0	3.0	0.8	1.7	6	4.8	0.4					39.4	
29.2	8.4	10.3	5.8	4.1	20	17.0	1.2					79.2	
32.9	10.4	14.5	7.5	4.8	23	28.7	1.5					113.4	
26.0			4.5	3.5	17	67.0	4.2					75.6	
25.7			4.0	3.5	16	65.0	4.2					64.5	
a. Largely calcareous concretions.													

Soil type: Wood River silt loam
 Soil No.: S51Nebr-40-6-(1-6)
 Location: 500 feet east and 300 feet north of SW corner, Sec. 22, T11N, R11W, Hall County, Nebraska.
 Vegetation: Native pasture; grama, western wheat grass and buffalo grass dominant.
 Parent material: Loess.
 Physiographic position: Nearly level flat in very gently undulating terrace plain.
 Topography: Nearly flat.
 Slope: Less than one percent.
 Erosion: None or slight.
 Drainage: Slow.
 Moisture: Moist.
 Stoniness: Free.
 Root distribution: Good.
 Described by: B. H. Williams.
 Date: October 8, 1951.
 Mandan

Lab.No.	Horizon	
911	A1	0-11 inches. Silt loam; dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist) friable, medium granular silt loam.
912	A2	11-16 inches. Silt loam; gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist); weak prismatic silt loam; crushes easily to medium crumb or soft granular mass. The primary structure aggregates are heavily coated with gray leached silt.
913	B2	16-23 inches. Silty clay; grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) grading to olive brown or dark olive brown in the lower part. The upper part of this layer has strongly developed columnar-prismatic structure with heavy coating of shiny nearly black organic colloids on the surface of the columns. The lower 3 inches of the columns are less well defined and become blocky where they grade with the next layer below. The column tops are only slightly rounded, are coated with a 1/4-inch degrading, partly leached, slightly lighter colored layer, and sharply contact the A2 above. The columns are very hard when dry, very firm moist and plastic when wet. They merge gradually with the layer below.
914	B3	23-27 inches. Silty clay; light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist). Medium blocky; plastic, wet; firm, moist; hard, dry; changes rather abruptly to the next layer below.
915	Bca	27-42 inches. Silty clay loam or light silty clay; light olive gray (5Y 6/2 dry) to olive gray (5Y 5/2.5 moist) massive, high in CaCO ₃ and CaSO ₄ and possibly other salts in small to fairly large spots and thread-like and decimated forms.
916	Cl	42-60 inches. Heavy silt loam or silty clay loam; light gray (5Y 7/2 dry) to olive gray (5Y 5.5/2 moist). Massive; calcareous, including some large hard lime concretions; other salts however are not visible.

SOIL SURVEY LABORATORY

SOIL TYPE Wood River silt loam

Mandan, North Dakota

SOIL NO. S51Nebr-40-8-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
			1B1a VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002	0.02-0.002	0.2-0.02 (19mm)	2A2 > 2	
925	0-6	A1p	0.1	0.2	0.6	1.6	19.3	60.7	17.5	16.3	64.7	-	sil
926	6-11	A12	0.1	0.2	0.5	1.7	20.5	60.1	16.9	15.7	66.0	-	sil
927	11-13	A2	0.1	0.2	0.5	1.4	17.7	65.7	14.4	19.1	65.2	-	sil
928	13-18	B2	-	0.2	0.3	1.0	12.5	49.7	36.3	15.5	47.2	-	sic1
929	18-27	B3	0.1	0.2	0.5	1.0	11.6	49.0	37.6	17.4	43.7	-	sic1
930	27-31	Bca-cs	0.1	0.2	0.6	1.1	13.4	51.3	33.3	21.2	44.1	-	sic1
931	31-51	C1	0.1	0.3	0.6	1.8	18.1	54.3	24.8	22.2	51.1	-	sil
932	51-60	C2	0.2	0.4	0.5	1.5	17.4	60.3	19.7	24.4	54.0	2a	sil
pH			ORGANIC MATTER			8A2 EST. % SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EX x 10 ³ MILLIMHOS PER CM 6A1a	CaCO ₃ equivalent per cent 6E1a	GYPSUM me / 100g SOIL 6F1a	MOISTURE TENSIONS			
SATURATED PASTE		1-5	1:10	% ORGANIC CARBON	% NITROGEN	C/N					1/10 ATMOS.	(per cent) 1/3 ATMOS.	15 ATMOS. 4B2
8C1b		8C1a	8C1a	6A1a									
	6.6	7.3	7.3	1.48			-	0.7	tr	-			8.2
	6.5	7.2	7.4	1.32			-	0.6	tr	-			8.3
	7.0	7.9	8.2	0.92			-	0.7	tr	-			6.8
	7.4	8.5	8.7	0.76			-	0.9	tr	-			19.0
	8.0	9.0	9.2	0.44			-	1.8	12	-			21.5
	7.8	7.9	8.0	0.20			0.27	5.2	3	74			18.9
	8.0	8.8	9.1	0.10			0.21	3.1	0	-			14.7
	7.9	9.3	9.5	0.10			0.20	3.1	2	-			10.3
5A1a CATION	5B1a CATIONS				5B1b	5D	SATURATION EXTRACT SOLUBLE 8A1					8A	
EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE		EXCHANGEABLE SODIUM PERCENTAGE ESP	6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄	PER CENT MOISTURE AT SATURATION	
	Cg 6N2b	Mg 6O2b	Na 6P2a	K 6Q2a									
←	milliequivalents per 100g soil				→	← milliequivalents per liter →					→		
16.0	9.5	3.3	0.3	1.6	2	1.3	0.4					41.8	
15.8	9.1	3.4	0.5	1.6	3	1.7	0.4					41.6	
12.8	6.6	3.3	1.2	1.5	9	4.8	0.1					38.0	
26.2	10.5	10.0	4.2	2.9	16	8.0	0.1					60.7	
27.8			4.4	3.2	16	14.1	0.6					82.2	
26.3			3.3	2.8	12	33.0	2.4					73.0	
25.2	11.6	10.6	5.5	2.9	22	27.6	1.2					55.7	
23.2			4.9	2.7	21	27.6	1.2					50.1	
a. largely calcareous concretions.													

Soil type: Wood River silt loam
 Soil No.: S51Nebr-40-8-(1-8)
 Location: 100 feet north and 50 feet west of SE corner, Sec. 32, T12N, R11W, Hall County, Nebraska.
 Vegetation: Irrigated corn, apparent yield about 100 bushels per acre.
 Parent material: Loess.
 Physiographic position: Terrace (stream slope).
 Topography: Undulating plain.
 Slope: One percent.
 Erosion: None to slight.
 Drainage: Medium good.
 Moisture: Moist.
 Stoniness: None.
 Root distribution: Good.
 Described by: B. H. Williams.
 Date: October 9, 1951.

Mandan

Lab. No.	Horizon	Description
925	Alp	0-6 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam; fine granular, soft, friable.
926	A12	6-11 inches. Same as above except medium blocky-fine granular structure.
927	A2	11-13 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam; medium blocky with nearly white coating along the structure planes and light streaks through the blocks. Rests abruptly on layer below.
928	B2	13-18 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) prismatic blocky silty clay; the prisms are coated with very dark brown (10YR 2/2 moist) colloidal organic matter and have a glazed sheen; very hard, dry; stiff plastic, moist; sticky when wet.
929	B3	18-27 inches. Grayish brown (2.5Y 5/2 dry) to dark grayish brown (2.5Y 4/2 moist) medium blocky, heavy silty clay loam or silty clay. Moderately friable, moist; moderately hard, dry; plastic when wet.
930	Bca-cs	27-31 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) silty clay loam; weak blocky structure; abundant salt and lime accumulation; friable at wide moisture range.
931	C1	31-51 inches. Pale yellow (2.5Y 7/4 dry) to light olive brown (2.5Y 4.5/4 moist) massive friable silt loam; no effervescence with dilute HCl, except on occasional fine spot or streak.
932	C2	51-60 inches. Same as above, except a few more lime spots and a few large hard concretions.
	C3	60-96 inches. Color as above; massive; calcareous; a few small, brown and strong brown mottlings.
	C4	96-120 inches. Little or no change from above except more pronounced mottlings, including some gray.

Note: The C horizons at this location have bright yellowish color, whereas the Wood River (profile S51Nebr-40-6) has dull chroma within the olive or gray range and is more strongly mottled.

SOIL SURVEY LABORATORY

SOIL TYPE Wood River silt loam

Mandan, North Dakota

SOIL NO. S51Nebr-40-10-(1-8)

LABORATORY NUMBER	DEPTH IN INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
			1B1a					3A1						
			VERY COARSE SAND 2-1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY <0.002			2A2 > 2 (19mm)		
941	0-9	A1	0.1	0.2	0.6	1.3	19.3	58.6	19.9	16.9	61.8	-	s11	
942	9-14	A2	-	0.3	0.7	3.1	18.3	58.0	19.6	17.3	59.7	-	s11	
943	14-21	B21	0.1	0.2	0.5	1.1	10.5	52.0	35.6	16.6	46.3	-	sic1	
944	21-32	B22	-	0.2	0.6	2.7	5.3	58.0	33.2	21.3	43.6	-	sic1	
945	32-36	C1cacs	0.1	0.3	1.4	4.2	18.5	51.2	24.3	13.0	57.7	-	s11	
946	36-44	C2	-	0.1	0.3	0.5	10.6	49.2	39.3	25.9	34.2	-	sic1	
947	44-54	C2	0.3	0.3	0.3	0.8	5.8	64.5	28.0	31.8	38.7	-	sic1	
948	54-60	C3	0.2	0.2	0.5	1.4	19.1	56.9	21.7	14.7	62.0	1a	s11	
pH			ORGANIC MATTER			EST. % SALT (BUREAU CUP)			ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM		CaCO ₃ equivalent per cent	GYPSUM ma./100g SOIL	MOISTURE TENSIONS (per cent)	
SATURATED PASTE		1:5	1:10	% ORGANIC CARBON	% NITROGEN	C/N						1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
8C1b		8C1a	8C1a	6A1a					8A2	6A1a	6E1a	6F1a		4B2
6.5	7.0	7.2	1.57				-	0.8	tr	-				6.7
6.9	7.9	7.9	1.09				-	0.8	tr	-				8.6
7.3	8.2	8.3	0.83				-	0.8	tr	-				19.0
8.1	9.0	9.2	0.42				-	2.0	1	-				18.8
7.9	8.0	8.1	0.29				0.36	6.0	3	29				15.4
7.8	8.8	9.2	0.26				0.22	5.3	2	-				14.2
8.0	9.0	9.1	0.34				0.25	4.5	2	-				18.3
8.0	9.1	9.3	0.18				-	4.0	1	-				12.6
5A1a CATION EXCHANGE CAPACITY		5B1a CATIONS EXTRACTABLE		5B1b CATIONS EXCHANGEABLE		5D2 EXCHANGEABLE SODIUM PERCENTAGE ESP	SATURATION EXTRACT SOLUBLE 8A1					8A PER CENT MOISTURE AT SATURATION		
NH ₄ OAc milliequivalents per 100g soil		Ca 6N2b	Mg 6O2b	Na 6P2a	K 6Q2a		6P1a Na	6Q1a K	CO ₃	HCO ₃	Cl	SO ₄		
16.6	10.0	3.1	0.4	1.9	2	2.8	1.5						41.6	
15.7	8.6	4.3	1.2	1.7	8	5.9	0.4						41.1	
26.6	12.0	8.8	3.0	3.5	11	6.5	0.4						57.6	
27.0		9.3	3.6	4.1	13	16.3	1.5						75.0	
23.5			3.5	3.9	15	40.0	4.5						58.2	
21.7			3.7	3.6	17	37.6	4.0						50.2	
23.8			4.3	4.1	18	37.2	3.3						55.4	
21.9			4.0	3.8	18	32.0	2.9						49.1	
a. Largely calcareous concretions.														

Soil type: Wood River silt loam
 Soil No.: S51Nebr-40-10-(1-8)
 Location: 1250 feet east and 100 feet north of SW corner, Sec. 32, T12N, R11W, Hall County, Nebraska.
 Vegetation: Cultivated oat stubble.
 Parent material: Loess.
 Physiographic position: Terrace.
 Topography: Gently undulating plain.
 Slope: Less than 1 percent.
 Erosion: None or slight.
 Drainage: Slow.
 Moisture: Moist.
 Described by: B. H. Williams.
 Date: October 9, 1951.

Lab.No.	Horizon	
941	A1	0-9 inches. Grayish brown (10YR 5/2 dry) to very dark brown (10YR 2/2 moist) silt loam; friable; soft granular.
942	A2	9-14 inches. Gray (10YR 5/1 dry) to very dark gray (10YR 3/1 moist) silt loam (broken surface of structure aggregates); medium to coarse blocky; light gray silt coating on outer surface of the blocks; vesicular; friable. Fairly abrupt break to the next horizon.
943	B21	14-21 inches. Grayish brown (10YR 5/2 dry) to very dark brown, broken surface, (10YR 2/3 moist) heavy silty clay loam (10YR 3/3 crushed) and (10YR 2/2 on the surface of the aggregates); coarse prismatic primary and medium blocky secondary structure; moderately friable moist; moderately hard dry; moderately plastic wet.
944	B22	21-32 inches. Grayish brown (2.5Y 5.5/2 dry) to dark grayish brown (2.5Y 4/2 moist) silty clay loam; blocky; friable moist; moderately hard dry.
945	C1ca-cs	32-36 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (2.5Y 4/2 moist) heavy silt loam or silty clay loam; massive; friable; high in lime and other salts.
946	C2	36-44 inches. Color as above; silt loam; massive; friable; calcareous, including streaks and spots of segregated lime.
947	C2	44-54 inches. Grayish brown (2.5Y 5/2 dry) to dark grayish brown (2.5Y 3.5/2 moist) silt loam; massive; friable; calcareous, including segregated lime mainly in the form of soft concretions. This is an incipient buried soil.
948	C3	54-60 inches. Light brownish gray (2.5Y 6.5/2 dry) to dark grayish brown (2.5Y 4/2 moist) silt loam; massive; friable; calcareous; some segregated lime.

Soil type: Wymore silty clay loam
 Soil No.: 860Nebr-55-1
 Classification: Maximal Chernozem.
 Location: 332 feet west and 225 feet south of the northeast corner of the southwest quarter Sec. 34, T6N, R8E,
 Lancaster County, Nebraska.

Crop: Sorghum.
 Parent material: Peorian loess.
 Climate: Subhumid.
 Physiography: Nearly level loess upland.
 Relief: Subnormal.
 Slope: 1 percent.
 Aspect: Essentially level with 1 percent slope toward the northwest.
 Erosion: Variable.
 Permeability: Moderately slow.
 Drainage: Moderately well drained.
 Ground water: Deep.
 Moisture: Near field capacity.
 Root distribution: A few root channels were observed extending through the profile to the C horizon.
 Described by: Joseph M. Downs.

ISL No.	Horizon	Description
14255	Ap	0 to 7 inches. Very dark gray (10YR 3/1 moist uncrushed) (10YR 5/2 dry) silty clay loam, weak fine granular structure, friable, no effervescence; abrupt smooth lower boundary.
14256	A3	7 to 11 inches. Very dark brown (10YR 2/2 moist uncrushed) (10YR 3/2 moist crushed) (10YR 6/2 dry) silty clay loam, moderate very fine subangular blocky structure, friable, no effervescence; abrupt smooth lower boundary; a very few fine brown mottles occur in the upper portion of this horizon.
14257	B21	11 to 16 inches. Very dark grayish brown (10YR 3/2 moist uncrushed) (2.5Y 4/2 moist crushed) (10YR 4/2 dry) silty clay, moderate fine subangular blocky breaking to very fine subangular blocky, common thin continuous clay films, firm, no effervescence, few fine medium hard dark brown to black concretions, few fine faint black and brown mottles; clear smooth lower boundary.
14258	B22	16 to 28 inches. Dark grayish brown (2.5Y 4/2 moist uncrushed) (10YR 6/2 dry) silty clay, moderate medium subangular blocky breaking to fine subangular blocky, common thin continuous clay films, firm, no effervescence, few fine medium hard dark brown to black concretions; abrupt wavy lower boundary.
14259	B3ca	28 to 33 inches. Dark grayish brown (2.5Y 4/2 moist uncrushed) (10YR 6/2 dry) silty clay, weak coarse subangular blocky, few discontinuous clay films, firm, common hard CaCO ₃ concretions, no effervescence in matrix material; clear wavy lower boundary.
14260	Cca	33 to 44 inches. Olive gray (5Y 5/2 moist uncrushed) (10YR 7/2 dry) silty clay loam, many fine distinct mottles (10YR 4/3 moist), few distinct fine very dark brown to black mottles, massive, friable, common hard CaCO ₃ concretions, very weak effervescence in matrix material; gradual wavy lower boundary.
14261	C1	44 to 52 inches. Olive gray (5Y 5/2 moist uncrushed) (10YR 7/2 dry) silty clay loam, many medium distinct mottles (10YR 4/3 moist), few distinct fine very dark brown to black mottles, massive, friable, no effervescence; smooth gradual lower boundary.
14262	C2	52 to 60 inches. Olive gray (5Y 5/2 moist uncrushed) (10YR 7/2 dry) silty clay loam, many medium distinct mottles (10YR 4/3 moist), massive, friable, no effervescence.

SOIL Wyoma silty clay loam SOIL Nos. 861Nebr-55-1 LOCATION Lancaster County, Nebraska

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB Nos. 14485-14492 December 1964

Depth (in)	Horizon	Size class and particle diameter (mm) 3A1											Coarse fragments			
		1B1a Total				Sand				Silt			2A2			
		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)	(2-4.1)	> 2	2-19	19-76
0-7	Ap	5.8	59.9	34.3	-	0.2a	0.2a	0.4a	5.0	38.0	21.9	43.2	0.8	-	-	-
7-11	A3	3.6	48.1	48.3	0.1a	-	0.1a	0.2a	3.2	25.4	22.7	28.7	0.4	-	-	-
11-18	B21	3.1	46.8	50.1	-	-	-	0.1a	3.0	24.8	22.0	27.9	0.1	-	-	-
18-25	B22	3.2	51.7	45.1	-	-	-	0.2b	3.0	26.7	25.0	29.8	0.2	-	-	-
25-33	B3ca	4.2	62.5	33.3	0.6c	0.2c	0.1c	0.3d	3.0e	31.8	30.7	35.0	1.2	tr.	tr.	tr.
33-45	Cca	4.7	57.3	38.0	0.8c	0.2c	0.1c	0.3d	3.3e	28.3	29.0	31.8	1.4	tr.	tr.	tr.
45-52	C1	3.1	64.1	32.8	-	-	-	0.3d	2.8e	33.3	30.8	36.3	0.3	-	-	-
52-60	C2	4.0	61.7	34.3	-	-	-	0.3d	3.7e	31.6	30.1	35.5	0.3	-	-	-
Pct of < 2 mm																
Pct of < 76mm																
Depth (in)	6A1a	6B1a	C/N	6K1c Carbonate as CaCO ₃	6C1a Exct. Iron as Fe Pct.	Bulk density			Water content			pH		6C1a (1.1)		
	Organic carbon	Nitrogen				g/cc	g/cc	g/cc	Pct	4B11	4B2	Ca/Mg	5C3		5C1	
	Pct	Pct								1/3-Bar Piece	15-Bar					
0-7	1.98	0.164	12	-	0.7	-	-	-	-	-	24.6	13.0	-	-	5.4	
7-11	1.24	0.086	14	-	1.0	-	-	-	-	-	33.4	19.8	-	-	5.8	
11-18	0.93	0.076	12	-	0.8	-	-	-	-	-	34.0	21.6	-	-	6.7	
18-25	0.79	0.070	11	-	0.8	-	-	-	-	-	32.9	20.1	-	-	7.2	
25-33	0.22	-	-	1	0.8	-	-	-	-	-	32.6	16.4	-	-	7.7	
33-45	0.34	-	-	2	0.8	-	-	-	-	-	33.2	18.4	-	-	7.7	
45-52	0.20	-	-	tr.	0.9	-	-	-	-	-	34.8	15.5	-	-	7.8	
52-60	0.22	-	-	tr.	0.8	-	-	-	-	-	35.2	16.0	-	-	7.9	
Depth (in)	Extractable bases 5B1a				5B1a Sum	6B1a Exct. Acidity	Det. Recd. 5A3a Sum	Cap. 5A1a NH ₄ OAc	8D3 Ca/Mg	Base saturation						
	6N2b Ca	6O2b Mg	6P2a Na	6Q2a K						5C3 Sum Cations Pct	5C1 NH ₄ OAc Pct					
	meq/100 g															
0-7	13.3	5.5	0.2	0.7	19.7	11.2	30.9	23.4	2.4	64	84					
7-11	19.1	10.2	1.0	0.9	31.2	9.3	40.5	32.1	1.9	77	97					
11-18	21.2	11.9	1.5	0.9	35.5	5.8	41.3	33.3	1.8	86	107					
18-25	20.7	10.8	1.8	0.9	34.2	3.0	37.2	32.0	1.9	92	107					
25-33	-	-	2.7	0.9	-	-	-	27.1	-	-	-					
33-45	-	-	2.2	0.9	-	-	-	28.7	-	-	-					
45-52	-	-	2.6	0.9	-	-	-	25.8	-	-	-					
52-60	-	-	2.7	0.9	-	-	-	26.8	-	-	-					
Depth (in.)	Ratios to Clay 8D1				<ul style="list-style-type: none"> a. > 50% Fe-Mn nodules. b. 5-25% Fe-Mn nodules. c. > 50% Carbonate nodules. d. 5-25% Carbonate nodules. 5-25% Fe-Mn nodules. e. 5-25% Carbonate nodules. 											
	NH ₄ OAc CBC	Exct. Iron	15-Bar Water													
0-7	.68	.020	.38													
7-11	.66	.021	.41													
11-18	.66	.016	.43													
18-25	.71	.018	.44													
25-33	.81	.024	.49													
33-45	.76	.021	.48													
45-52	.79	.027	.47													
52-60	.78	.023	.47													

Soil type: Wymore silty clay loam
 Soil No.: 861Ebr-55-1
 Classification: Maximal Chernozem.
 Location: 0.2 mile west and 450 feet north of the southeast corner Sec. 20, T7N, R8E, Lancaster County, Nebraska.
 Crop: Alfalfa.
 Parent material: Peorian loess.
 Climate: Subhumid.
 Physiography: Narrow, nearly level loess upland.
 Relief: Subnormal.
 Slope: 1 percent.
 Erosion: Moderate.
 Permeability: Moderately slow.
 Drainage: Moderately well drained.
 Ground water: Deep.
 Moisture: Below field capacity.
 Root distribution: A few roots extending to the C2. Largest alfalfa roots from surface through E22. Land owner indicated no fertilizer was applied.
 Described by: Joseph M. Downs.

ISL No.	Horizon	
14485	Ap	0 to 7 inches. Silty clay loam (10YR 3/1) weak fine granular structure, friable, no effervescence; abrupt smooth lower boundary.
14486	A3	7 to 11 inches. Silty clay loam (10YR 2/2 uncrushed) (10YR 3/2 crushed) moderate very fine sub-angular blocky, friable, no effervescence; clear smooth lower boundary, few fine brown mottles occur in this horizon.
14487	E21	11 to 18 inches. Silty clay (10YR 3/2 uncrushed) (2.5Y 4/2 crushed) moderate fine subangular blocky breaking to fine subangular blocky, common continuous thin clay films, firm, no effervescence, few brown mottles; gradual smooth lower boundary.
14488	E22	18 to 25 inches. Silty clay (2.5Y 4/2) moderate medium subangular blocky breaking to fine sub-angular blocky, common continuous thin clay films, firm, no effervescence, few fine medium hard dark brown concretions; abrupt wavy lower boundary.
14489	B3ca	25 to 33 inches. Silty clay (2.5Y 4/2) weak coarse subangular blocky, few discontinuous clay films, firm, common hard CaCO ₃ concretions, no effervescence; gradual wavy lower boundary.
14490	Cca	33 to 45 inches. Silty clay loam (2.5Y 5/2) many medium distinct mottles (10YR 5/3); brown color is more distinct than in lower horizons, friable, very weak effervescence, common hard CaCO ₃ concretions, common CaCO ₃ coatings on broken clod surfaces; gradual smooth lower boundary.
14491	C1	45 to 52 inches. Silty clay loam (2.5Y 5/2) many medium distinct mottles (10YR 5/3), massive, friable, very weak effervescence, occasional small hard CaCO ₃ concretions, occasional fine CaCO ₃ coatings on broken clod faces; gradual smooth lower boundary.
14492	C2	52 to 60 inches. Silty clay loam (2.5Y 5/2) many medium distinct mottles (10YR 5/3), massive, friable, very weak effervescence, occasional small hard CaCO ₃ concretions, about equal amounts of 2.5Y 5/2 and 10YR 5/3 colors exist in the C horizon, other intermediate colors are present; brown colors appear somewhat as horizontal streaks.

SOIL TYPE Wymore LOCATION Pawnee County, Nebraska
silty clay loam

SOIL NOS. 958Nebr-67-2-(1-9) LAB. NOS. 9139-9147

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1K1a		3A1					2A2		> 2	
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002		
2-1	1-0.5	0.5-0.25	0.25-0.10	0.10-0.05	0.05-0.002	< 0.002	0.2-0.02	0.02-0.002				
0-5	Alp	<0.1	0.1	0.2a	0.4a	1.3a	57.6	40.4	32.1	27.0	-	sic/sicl
5-12	B1	<0.1	<0.1	0.1a	0.2a	0.8a	51.5	47.4	25.4	27.0	-	sic
12-20	B21	<0.1	<0.1	0.1a	0.1a	0.6a	53.2	46.0	24.1	29.8	-	sic
20-28	B22	<0.1	<0.1	<0.1	<0.1	0.5b	58.2	41.3	26.8	31.9	-	sic
28-37	B23	<0.1	<0.1	<0.1	<0.1	0.5b	62.6	36.9	28.1	35.0	-	sicl
37-46	C	<0.1	<0.1	<0.1	<0.1	0.5b	63.9	35.6	27.0	37.4	-	sicl
46-50	D1	<0.1	<0.1	<0.1	<0.1	0.5b	65.5	34.0	24.6	41.4	-	sicl
50-54	D2	0.9c	2.6c	3.2a	4.7a	3.2a	54.1	31.3	28.1	31.6	-	sicl
54-63	D3	1.0c	3.1c	3.6a	5.3a	3.6a	49.8	33.6	27.4	28.6	-	sicl

pH	ORGANIC MATTER					6C1a	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM	6E1a	MOISTURE TENSIONS				
	6A1a		6B1a		Free Iron as % Fe ₂ O ₃				CoCO ₃ equiv-alent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	ORGANIC CARBON	NITRO-GEN	C/N										
1:1	1:5	1:10	%	%									
6.3			1.84	0.153	12.0	1.2	0.4				16.8		
5.8			1.48	0.116	12.8	1.3	0.3				20.5		
5.9			0.78	0.066	12	1.2	0.3				19.9		
6.1			0.43	0.048	9	1.2	0.3				18.9		
6.4			0.22			1.0	0.3				17.8		
6.6			0.21			1.5	0.3	Δ			17.5		
6.7			0.20			2.0	0.3	Δ			16.7		
6.7			0.19			1.2	0.3	Δ			12.9		
6.7			0.21			1.5	0.3	Δ			14.1		

CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					BASE SAT. % NH ₄ Ac EXCHL	SAT. EXT. SOL.		4B4 Field State Water	4A4 Vol. Wt. g/cc	8A MOISTURE AT SATURATION %
	6N2b		6H1a		6P2a		6P1a	6Q1a			
	Ca	Mg	H	Na	K		me	K			
29.0	23.0	5.8	6.6	<0.1	0.6	101	0.4	0.1			63.3
33.2	23.5	7.6	7.6	0.1	0.5	95	0.5	0.1			79.1
31.7	23.8	8.1	6.2	0.2	0.7	103	0.6	0.1	29.2	1.40	82.0
31.3	22.6	7.7	4.6	0.2	0.6	99	0.6	0.1			82.3
28.9	21.6	7.0	3.3	0.3	0.6	102	0.8	0.1	24.9	1.50	75.8
28.5	21.2	6.9	3.7	0.4	0.5	102	0.9	<0.1			73.1
26.2	20.4	6.3	2.5	0.4	0.5	105	1.0	<0.1			65.8
21.6	16.0	4.6	2.4	0.3	0.3	98	1.1	<0.1			51.2
17.3	16.4	4.9	2.9	0.3	0.3	126	1.0	<0.1	21.9	1.49	56.3

a. Few smooth light to dark brown coner. (Fe?)
 b. Common smooth light to dark brown coner. (Fe?)
 c. Trace smooth light to dark brown coner. (Fe?)

Soil Type: Wymore silty clay loam
 Classification: Brunizem
 Location: 300 feet south and 110 feet east of center of Sec. 10, T1N, R11E, about 1 mile west and 3 miles south of Pawnee City, Pawnee County, Nebraska.
 Date Sampled: September 11, 1958.
 Collectors: R. Jordan, J. Elder, M. James.
 Use: Cultivated (Iespedeza 1958).
 Climate: Average annual precipitation 31 inches; average annual temperature 53° F.
 Parent Material: Loess.
 Physiography: Loess-capped glacial upland.
 Slope: 2 percent southwest.
 Soil No.: S58Nebr-67-2-(1-9)

Lincoln

Lab. No.	Horizon	Description
9139	Alp	0-5 inches. Very dark brown (10YR 2/2 dry) to very dark brown (10YR 2/2 moist) silty clay loam; moderate fine granular structure; slightly hard dry, friable, moist; noncalcareous; abrupt smooth lower boundary.
9140	B1	5-12 inches. Very dark grayish brown (10YR 3/2 dry) to very dark brown (10YR 2/2 moist) silty clay; moderate fine blocky structure; hard, dry, firm moist; noncalcareous; gradual smooth lower boundary.
9141	B21	12-20 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9142	B22	20-28 inches. Grayish brown (2.5Y 5/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay, a few fine faint yellowish brown mottles; moderate medium and fine blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9143	B23	28-37 inches. Light brownish gray (2.5Y 6/2 dry) to dark grayish brown (10YR 4/2 moist) silty clay loam; a few fine distinct yellowish brown and dark brown mottles; moderate medium blocky structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9144	C	37-46 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (2.5Y 4/2 moist) silty clay loam; many medium distinct yellowish brown and dark brown mottles; weak medium prismatic structure; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9145	D1	46-50 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) silty clay loam; weak medium subangular blocky structure; slightly hard dry, friable moist; noncalcareous; abrupt wavy lower boundary.
9146	D2	50-54 inches. Light brownish gray (10YR 6/2 dry) to dark brown (7.5YR 3/2 moist) silty clay loam; a few fine distinct dark reddish brown mottles; weak medium subangular blocky structure; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9147	D3	54-63 inches. Light brownish gray (10YR 6/2 dry) to dark brown (7.5YR 3/2 moist) silty clay loam; common fine distinct dark reddish brown mottles; weak medium granular structure; slightly hard dry, friable moist; noncalcareous.

Note: The D horizons are part of a Planosol in Sangamon weathered material. Weathered till was encountered at 6½ feet. Horizons Alp, B22 and D3 were sampled for Bureau of Public Roads.

SOIL SURVEY LABORATORY Lincoln, Nebr. April 1959

SOIL TYPE Wymore LOCATION Pawnee County, Nebraska
 silty clay loam

SOIL NOS. S58Nebr-67-7-(1-8) LAB. NOS. 9177-9184

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND 2.1	COARSE SAND 1-0.5	MEDIUM SAND 0.5-0.25	FINE SAND 0.25-0.10	VERY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002			> 2	
0-5	Alp	<0.1	0.1a	0.2a	0.3a	1.4a	63.2	34.8	41.4	23.4	-	sic1
5-9	B1	<0.1	<0.1	0.1a	0.2a	0.7a	56.4	42.6	30.2	27.0	-	sic
9-17	B21	<0.1	<0.1	0.1b	0.2b	0.5a	52.4	46.8	25.0	28.0	-	sic
17-25	B22	<0.1	0.1b	0.1b	0.2b	0.5a	58.0	41.1	26.1	32.5	-	sic
25-32	B23	<0.1	0.1b	0.1b	0.1b	0.5a	59.3	39.9	27.9	32.0	-	sic1/sic
32-40	B24	<0.1	0.1b	0.1b	0.1b	0.4a	61.7	37.6	32.2	30.0	-	sic1
40-53	C	<0.1	<0.1	<0.1	<0.1	0.6a	65.0	34.4	32.8	32.8	-	sic1
53-63	D	0.2	1.9	2.5	4.4	2.8	58.6	29.6	30.5	33.0	-	sic1

pH	ORGANIC MATTER			6C1a	ELECTRICAL CONDUCTIVITY	6E1a	MOISTURE TENSIONS			
	8C1a	6A1a	6B1a	Free Iron as Fe ₂ O ₃	EC x 10 ³ MILLIMOS PER CM	CoCO ₃ equiv. am	GYP SUM mo./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:1	1:5	1:10	C/N		%	%	%	%	%
5.6			2.09	0.163	12.8	1.0	0.3			14.5
5.7			1.84	0.150	12.3	1.1	0.3			18.6
5.9			1.24	0.095	13.0	1.2	0.3			20.4
6.1			0.63	0.060	10	1.4	0.3			19.6
6.3			0.38			1.4	0.3			18.6
6.6			0.24			1.1	0.3	<1		18.2
6.8			0.15			0.5	0.3	<1		16.9
6.9			0.20			1.2	0.4	<1		12.8

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS					5B1a	BASE SAT. %		SATURATION EXTRACT SOL.		5A
	6N2b	6O2b	6H1a	6P2a	6Q2a	NH ₄ Ac EXCH.	6P1a	6Q1a			MOISTURE AT SATURATION
	Ca	Mg	H	Na	K	%	No	K	milliequivalents per liter		%
26.6	17.2	4.7	9.8	0.1	0.8	86	0.4	0.2			56.6
31.7	21.3	6.5	9.0	0.1	0.6	90	0.4	0.1			68.0
34.0	23.8	7.3	7.4	0.2	0.7	94	0.6	0.1			72.4
32.2	23.4	7.3	6.2	0.2	0.6	98	0.6	0.1			79.6
30.2	22.8	6.9	4.5	0.3	0.6	101	0.8	0.1			77.7
29.1	23.1	6.9	3.3	0.4	0.6	106	0.9	0.1			77.5
27.2	21.8	6.1	2.9	0.5	0.5	106	1.2	<0.1			66.9
21.3	17.3	4.4	3.2	0.5	0.3	106	1.5	<0.1			52.3

a. Few smooth and irregular dark brown to black concr. (Fe-Mn?)
 b. Many smooth and irregular dark brown to black concr. (Fe-Mn?)

Soil Type: Wymore silty clay loam
 Classification: Brunizem
 Location: 1170 feet west and 580 feet south of NE corner Sec. 1, T1N, R11E, about 1 mile east and 1 mile south of Pawnee City, Pawnee County, Nebraska.
 Date Sampled: September 16, 1958.
 Collectors: J. Allen, J. Elder, R. Greenawalt.
 Use: Cultivated (stubble).
 Climate: Average annual precipitation 31 inches; average annual temperature 53° F.
 Parent Material: Loess.
 Physiography: Loess-capped glacial till upland.
 Slope: 4 percent southwest.
 Soil No.: S58Nebr-67-7-(1-8)

Lincoln

Lab. No.	Horizon	Description
9177	Alp	0-5 inches. Dark gray (10YR 4/1 dry) to very dark brown (10YR 2/2 moist) silty clay loam; weak medium granular structure; slightly hard dry, friable moist; noncalcareous; abrupt smooth lower boundary.
9178	B1	5-9 inches. Very dark grayish brown (10YR 3/2 dry) to very dark brown (10YR 2/2 moist) heavy silty clay loam; moderate very fine blocky structure with clay films on the aggregate faces; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9179	B21	9-17 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) silty clay; moderate medium and fine blocky structure with clay films on the aggregate faces; hard dry, firm moist; noncalcareous; clear smooth lower boundary.
9180	B22	17-25 inches. Dark brown (10YR 4/3 dry) to dark grayish brown (10YR 4/2 moist) silty clay, a few fine faint dark yellowish brown mottles; moderate medium and fine blocky structure with clay films on the aggregate faces; hard dry, firm moist; noncalcareous; gradual smooth lower boundary.
9181	B23	25-32 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) silty clay; common fine faint dark yellowish brown mottles; moderate medium blocky structure with clay films on the aggregate faces; hard dry, firm moist; noncalcareous; clear smooth lower boundary.
9182	B24	32-40 inches. Mottles 50 percent grayish brown (2.5Y 5/2 dry) to olive brown (2.5Y 4/4 moist), 50 percent light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) heavy silty clay loam; a few fine distinct yellowish brown mottles and common fine distinct reddish brown iron and manganese concretions; moderate medium and fine blocky structure with patchy clay films on the aggregate faces; slightly hard dry, friable moist; noncalcareous; clear smooth lower boundary.
9183	C	40-53 inches. Light brownish gray (2.5Y 6/2 dry) to gray (5Y 5/1 moist) silty clay loam; weak medium and coarse blocky structure, a few small pipe-like iron concretions are present; slightly hard dry, friable moist; few scattered lime concretions; abrupt smooth lower boundary.
9184	D	53-63 inches. Brown (10YR 5/3 dry) to dark brown (7.5YR 4/2 moist) silty clay loam; weak fine platy structure; soft dry, very friable moist; noncalcareous.

Note: There are common fine distinct dark reddish brown mottles and also many fine pores present in the "D" horizon. The contact zone between the C and D horizons consists of thin lenses of dark colored material, probably organic stainings, also concentrations of yellowish brown iron stains. Horizons Alp, B22 and D were sampled for the Bureau of Public Roads.