

Allen

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

...WYOMING

Soil Survey Investigations Report No. 8

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

...WYOMING

August 1966

SOIL CONSERVATION SERVICE • U.S. DEPARTMENT OF AGRICULTURE
In cooperation with
WYOMING AGRICULTURAL EXPERIMENT STATION

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-indurated 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
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 - a. Carbonate and noncarbonate clay
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 - a. Field state
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 - 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. Oven-dry
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 - a. Oven-dry
 3. Cores
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 - B. Water retention
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 - a. Sieved samples
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 - c. Natural clods
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 - a. Acidity by $\text{BaCl}_2\text{-TEA}$, pH 8.2; bases by NH_4OAc , pH 7.0
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 - a. Barium by flame photometry
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 - a. Uncorrected
 - b. Corrected (exchangeable)
 2. KCl-TEA extraction, pH 8.2
 - C. Base saturation
 1. NH_4OAc , pH 7.0
 2. NaOAc , pH 8.2
 3. Sum of cations
 - D. Sodium saturation (exchangeable Na pct.)
 1. NaOAc , pH 8.2
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 - a. Weight loss
 - B. Nitrogen
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 - a. Ammonia distillation
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 - a. Ammonia distillation
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 - a. Orthophenanthroline colorimetry
 3. Dithionite-citrate-bicarbonate extraction
 - a. Potassium-thiocyanate colorimetry
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 - D. Manganese
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 - a. Aluminon III
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 - a. EDTA titration
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 - b. Phosphate titration
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 1. Glycerol retention
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 - B. Saturated paste, capillary rise
 1. Saturation extract
 - a. Conductivity
 - C. pH
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 - a. Water dilution
 - b. Saturated paste
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 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*

WYOMING

<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>
Arvada	Natrona	S54Wyo-13-1	3	Larimer	Platte	S58Wyo-16-4	51
Colby	Goshen	S50Wyo-8-2	5		Platte	S58Wyo-16-8	53
	Goshen	S50Wyo-8-3	7		Platte	S58Wyo-16-9	55
Creighton	Goshen	S54Wyo-8-4	9	Mitchell	Goshen	S50Wyo-8-4	57
	Goshen	S54Wyo-8-5	11		Goshen	S52Wyo-8-1	59
Dunday	Goshen	S53Wyo-8-4	13		Goshen	S52Wyo-8-4	61
Dwyer	Goshen	S53Wyo-8-6	15		Goshen	S52Wyo-8-6	63
Fort Collins	Platte	S58Wyo-16-1	17		Goshen	S52Wyo-8-7	65
	Platte	S58Wyo-16-2	19	Otero	Goshen	S53Wyo-8-5	67
	Platte	S58Wyo-16-3	21	Prarmigan	Park	S61Wyo-15-1	69
	Platte	S58Wyo-16-5	23		Park	S61Wyo-15-2	71
	Platte	S58Wyo-16-6	25	Renohill	Campbell	S54Wyo-3-1	73
	Platte	S58Wyo-16-7	27		Campbell	S54Wyo-3-2	75
	Platte	S58Wyo-16-10	29	Rosebud	Goshen	S53Wyo-8-7	77
Glenberg	Goshen	S52Wyo-8-2	31		Goshen	S54Wyo-8-2	79
Griffy	Fremont	S54Wyo-7-3	33		Goshen	S54Wyo-8-3	81
	Fremont	S54Wyo-7-4	35	Stoneham	Goshen	S54Wyo-8-1	83
Haverson	Goshen	S50Wyo-8-7	37	Terry	Goshen	S53Wyo-8-8	85
Keith	Goshen	S53Wyo-8-3	39		Goshen	S53Wyo-8-9	87
Keota	Goshen	S50Wyo-8-1	41	Ulm	Campbell	S54Wyo-3-3	89
	Goshen	S53Wyo-8-1	43		Campbell	S54Wyo-3-4	91
	Goshen	S53Wyo-8-2	45	Valentine	Goshen	S50Wyo-8-6	93
Kim	Goshen	S50Wyo-8-5	47	Vasquez	Park	S61Wyo-15-3	95
	Goshen	S52Wyo-8-3	49		Park	S61Wyo-15-4	97

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<u>County</u>	<u>Soil Series</u>	<u>Soil Survey No.</u>	<u>Page</u>	<u>County</u>	<u>Soil Series</u>	<u>Soil Survey No.</u>	<u>Page</u>
Campbell	Renohill	S54Wyo-3-1	73	Goshen	Mitchell	S52Wyo-8-7	65
	Renohill	S54Wyo-3-2	75		Otero	S53Wyo-8-5	67
	Ulm	S54Wyo-3-3	89		Rosebud	S53Wyo-8-7	77
	Ulm	S54Wyo-3-4	91		Rosebud	S54Wyo-8-2	79
Fremont	Griffy	S54Wyo-7-3	33	Rosebud	S54Wyo-8-3	81	
	Griffy	S54Wyo-7-4	35	Stoneham	S54Wyo-8-1	83	
Goshen	Colby	S50Wyo-8-2	5	Terry	S53Wyo-8-8	85	
	Colby	S50Wyo-8-3	7	Terry	S53Wyo-8-9	87	
	Creighton	S54Wyo-8-4	9	Valentine	S50Wyo-8-6	93	
	Creighton	S54Wyo-8-5	11	Natrona	Arvada	S54Wyo-13-1	3
	Dunday	S53Wyo-8-4	13	Park	Ptarmigan	S61Wyo-15-1	69
	Dwyer	S53Wyo-8-6	15	Ptarmigan	S61Wyo-15-2	71	
	Glenberg	S52Wyo-8-2	31	Vasquez	S61Wyo-15-3	95	
	Haverson	S50Wyo-8-7	37	Vasquez	S61Wyo-15-4	97	
	Keith	S53Wyo-8-3	39	Platte	Fort Collins	S58Wyo-16-1	17
	Keota	S50Wyo-8-1	41	Fort Collins	S58Wyo-16-2	19	
	Keota	S53Wyo-8-1	43	Fort Collins	S58Wyo-16-3	21	
	Keota	S53Wyo-8-2	45	Fort Collins	S58Wyo-16-5	23	
	Kim	S50Wyo-8-5	47	Fort Collins	S58Wyo-16-6	25	
	Kim	S52Wyo-8-3	49	Fort Collins	S58Wyo-16-7	27	
	Mitchell	S50Wyo-8-4	57	Fort Collins	S58Wyo-16-10	29	
	Mitchell	S52Wyo-8-1	59	Larimer	S58Wyo-16-4	51	
	Mitchell	S52Wyo-8-4	61	Larimer	S58Wyo-16-8	53	
	Mitchell	S52Wyo-8-6	63	Larimer	S58Wyo-16-9	55	

SOIL SURVEY LABORATORY Mandan, North Dakota 9/19/55

SOIL TYPE Arvada LOCATION Natrona County, Wyoming
 very fine sandy loam

SOIL NOS. S54Wyo-13-1 LAB. NOS. 2479-2484

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	VEPY FINE SAND 0.10-0.05	SILT 0.05-0.002	CLAY < 0.002	0.2-0.02	0.02-0.002	> 2 (< 19mm)	
0-3	A2	0.7	3.7	5.1	14.6	34.4	33.1	8.4	61.8	15.2	-	vfs1
3-9	B2t	0.2	1.2	1.8	6.6	23.1	25.8	41.3	42.6	10.8	-	c
9-15	B3sa	0.1	0.3	0.8	5.8	32.0	35.3	25.7	59.8	11.9	-	l
15-23	C1sa	0.1	0.3	0.8	6.6	37.0	32.3	22.9	61.2	13.1	-	l
23-30	C2sa	0.7	1.8	2.1	10.1	35.1	27.0	23.2	57.3	12.1	-	scl
30-41 1/2	C3sa	0.2	2.0	2.3	9.5	37.2	24.2	24.6	56.4	11.8	-	scl

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 6A1a	6E1a	6F1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a	C/N	ESTX SALT (BUREAU CUP)		CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITROGEN %		ESTX SALT %		%	%	%	%	%
7.0	7.3	7.2	0.62	.058	10.7	-	0.5	1	-	-	-	3.3
8.0	9.2	9.4	0.73	.081	9.0	-	1.1	1	-	-	-	16.2
8.1	8.9	9.1	0.45	.049	9.2	0.29	6.0	10	-	-	-	9.7
8.1	8.7	8.9	0.28			0.43	8.6	10	2	-	-	8.3
8.3	9.2	9.3	0.18			0.33	7.3	8	-	-	-	8.3
8.4	9.5	9.6	0.15			0.29	5.8	6	-	-	-	9.0

5A1a	EXTRACTABLE CATIONS					5B1a	5D2	SATURATION EXTRACT SOLUELE					8A
CATION EXCHANGE CAPACITY (NH ₄ Ac)	6N2b	6O2b	6P2a			6Q2a	EXCH. No %	6P1a	6Q1a	6J1a	6K1a	6L1a	MOISTURE AT SATURATION
	Ca	Mg	H	Na	K		No	K	HCO ₃	Cl	SO ₄	%	
	milliequivalents per 100g. soil						milliequivalents per liter						
6.5	3.9	1.9		0.2	0.6	3	1.7	0.4				26.9	
29.4		14.5		4.7	0.4	14	10.4	0.1				60.7	
15.2				4.9	0.3	16	47.0	0.2	5.1	23.5	51.8	51.6	
13.2				5.3	0.3	17	65.0	0.3	5.6	23.0	106.6	46.9	
12.8				5.4	0.4	20	59.0	0.3	5.1	19.0	76.6	47.1	
14.0				6.1	0.5	25	51.0	0.3	4.6	16.8	52.3	51.7	

Soil type: Arvada very fine sandy loam
 Soil No.: 854Wyo-13-1
 Location: Natrona County, Wyoming; 300 feet south and 150 feet east of northwest corner of Section 29, T33N, R81W.
 Physiographic position: Sloping faces of old terrace levels now uplands.
 Topography: Simple convex slope of approximately 5 percent facing west.
 Drainage: Well drained.
 Vegetation: Medium cover of western wheatgrass, blue grama grass, threadleaf sage, big sage, cactus and some mosses and lichens.
 Use: Pasture.
 Collected by: L. T. Alexander, James Allen, Harold Bindschadler, A. J. Cline, and Clarence Faulks, August 17, 1954.
 Described by: A. J. Cline.

Horizon and
 Lincoln
 Lab. Number

- A2 2479 0 to 3 inches. White (10YR 8/1 dry) to grayish brown (10YR 5/2.5 moist) fine sandy loam; soft when dry, very friable when moist; weak coarse platy breaking to moderate fine granular; noncalcareous; lower boundary clear and smooth.
- B2t 2480 3 to 9 inches. Grayish brown (10YR 5/2.5 dry) to dark grayish brown (10YR 4/2.5 moist) light silty clay; very hard when dry, very firm when moist; moderate medium columnar breaking to strong medium angular blocky; noncalcareous; structural aggregates have well rounded caps; clear moderately thick clay skins; lower boundary abrupt and smooth.
- B3sa 2481 9 to 15 inches. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/3 moist) heavy silty clay loam; very hard when dry, firm when moist; moderate coarse prismatic breaking to moderate coarse angular blocky; calcareous; the horizon contains a few small calcium carbonate concretions; lower boundary gradual and irregular.
- C1sa 2482 15 to 23 inches. Light brownish gray (2.5Y 6/2 dry) to light olive brown (2.5Y 5/3 moist) light clay loam; very hard when dry, firm when moist; weak coarse angular blocky structure; calcareous; the horizon contains much calcium carbonate and other salts; calcium carbonate chiefly as lime flour but with a few concretions; lower boundary gradual and smooth.
- C2sa 2483 23 to 30 inches. Light olive gray (5Y 6/2.5 dry) to olive gray (5Y 5/2.5 moist) light sandy clay loam; very hard when dry, firm when moist; massive to very weak coarse subangular blocky structure; calcareous; horizon contains much accumulated calcium carbonate and other salts; calcium carbonate chiefly as lime flour; there are a few concretions believed to be calcium sulphate in the lower part; lower boundary gradual and smooth.
- C3sa 2484 30 to 41 inches plus. Pale olive (5Y 6/3 dry and moist) light sandy clay loam; very hard when dry, firm when moist; massive; calcareous; horizon contains some visible calcium carbonate and other salts but much less than the horizons above; this horizon consists principally of reworked clayey alluvium washed down the sides of old terrace levels.

SOIL SURVEY LABORATORY Mandan, N. Dak.

OIL TYPE Colby loam **LOCATION** Goshen County, Wyoming

SOIL NOS. S50Wyo-8-2 **LAB. NOS.** 514-519

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 ($< 19\mu m$)		
0-2	A11	0.6	0.6	0.7	4.2	44.1	38.8	11.0	74.0	12.1	-	1	
2-4 1/2	A12	-	0.8	1.0	3.2	36.9	42.7	15.4	65.5	16.4	-	1	
4 1/2-20	AC	-	-	1.2	2.4	37.9	46.0	12.5	69.5	15.9	-	1	
20-34	C1ca	-	0.3	0.5	1.7	38.0	45.2	14.3	70.8	13.6	-	1	
34-60	C2ca	-	-	0.3	1.4	39.9	44.5	13.9	72.6	12.8	-	1	
a		0.7	5.7	7.4	16.2	31.2	21.2	17.6	54.9	7.7	1	vfs1	
8C1b SATURATED PASTE		pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP) <td>EC x 10³ MILLIMHOS PER CM <td>CaCO₃ equivalent</td> <td>GYPSUM ms./100g. SOIL</td> <td>1/10 ATMOS.</td> <td>1/3 ATMOS.</td> <td>15 ATMOS.</td> </td>	EC x 10 ³ MILLIMHOS PER CM <td>CaCO₃ equivalent</td> <td>GYPSUM ms./100g. SOIL</td> <td>1/10 ATMOS.</td> <td>1/3 ATMOS.</td> <td>15 ATMOS.</td>	CaCO ₃ equivalent	GYPSUM ms./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N		8A1a	%		%	%	%	
7.9	8.5	8.8	1.30	.104	12.5	-	0.4	1	-			7.9	
7.9	8.6	8.9	1.25	.116	10.8	-	0.4	9	-			11.3	
8.1	8.9	9.2	0.43	.040	10.7	-	0.3	8	-			9.1	
8.4	9.3	9.5	0.18	.024		-	0.4	6	-			7.8	
8.6	9.5	9.7	0.09	.016		-	0.9	5	-			7.7	
7.9	8.5	8.8	0.86	.090	9.6	-	0.5	4	-			10.0	
5A1a CATION EXCHANGE CAPACITY		EXCHANGEABLE CATIONS					5D2	8A1 SATURATION EXTRACT SOLUBLE				8A	
	NE ₁ OAc	Ca	Mg	H	Na	K	EXCH. No %	6P1a	6Q1a				MOISTURE AT SATURATION
		milliequivalents per 100g. soil						milliequivalents per liter					
18.7					0.1	1.5	-	6.7	1.8				43.3
21.7					0.5	1.5	2	-	1.2				48.9
19.2					0.4	2.1	2	0.7	0.9				42.4
18.5					1.3	3.4	7	2.5	0.7				40.2
17.9					2.8	3.2	16	11.0	0.3				38.0
19.3					0.7	1.8	4	1.3	0.5				39.1
a. Composite irrigated surface sample from SE1/4 SW1/4 SW1/4 Sec. 14, T23N, R61W.													

Soil type: Colby loam

Soil No.: S50Wyo-8-2

Location: Southeast quarter of northeast quarter of northeast quarter of Section 25, T24N, R62W, Goshen County, Wyo.

Vegetation: Moderately good cover of blue grama, threadleaf sedge, weeds and herbs; virgin.

Parent material: Probably Bignell or later loess.

Slope: Near crest of hill on 4 percent slope; hilly upland.

Described by: W. M. Johnson

Horizon and

Mandan

Lab. Number

A11 514	0 to 2 inches. Light brownish gray (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2 moist); very soft, very friable; very weak platy loam that breaks to weak fine granules; very mildly calcareous; strongly matted with grass roots.
A12 515	2 to 4½ inches. Pale brown (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2.5 moist); very soft, very friable; very weak subangular blocky silt loam that crushes to weak fine granules; calcareous; matted with grass roots.
AC 516	4½ to 20 inches. Light yellowish brown (2.5Y 6.5/3 dry) to olive brown (2.5Y 4.5/4 moist) moderately prismatic; soft, friable; calcareous silt loam that crushes to weak granules.
C1ca 517	20 to 34 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) weak prismatic; soft, friable; calcareous silt loam.
C2ca 518	34 to 60 inches. Pale brown (10YR 6.5/3 dry) to brown (10YR 5/3 moist); soft, friable; weak prismatic calcareous silt loam.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Colby loam **LOCATION** Goshen County, Wyoming

SOIL NOS. S50Wyo-8-3 **LAB. NOS.** 520-526

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	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			
0-3 1/2	A11	-	0.8	0.7	3.8	30.0	43.6	21.1	60.5	15.7	-	1
3 1/2-8	A12	-	0.4	0.6	4.1	29.7	39.6	25.6	58.4	14.2	-	1
8-19	B2	-	0.3	0.6	4.5	32.5	39.3	22.8	60.6	14.7	-	1
19-36	C1ca	-	0.2	0.2	2.1	27.3	52.3	17.9	57.5	23.7	-	sil
36-43	C2ca	-	-	0.6	3.1	36.0	52.3	8.0	70.6	19.9	-	sil
43-56	C3ca	-	-	0.1	3.3	43.4	42.0	11.2	73.7	14.1	-	1
a		0.9	8.0	7.6	11.2	22.9	31.5	17.9	49.4	11.4	-	1
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
8C1b	8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM @ 25°C	CaCO ₃ equivalent	GYPSUM me./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:5	1:10		ORGANIC CARBON %	NITROGEN %	C/N			%		%	%	%
7.1	7.7	8.0	1.75	.143	12.2	-	0.4	-	-			11.8
7.3	7.9	8.1	1.07	.108	9.9	-	0.3	-	-			13.0
7.7	8.4	8.6	0.79	.088	9.0	-	0.4	-	-			12.4
8.2	9.1	9.2	0.48	.063	7.6	-	0.4	15	-			13.9
8.3	9.3	9.5	0.18	.026		-	1.0	10	-			9.8
8.1	9.1	9.3	0.14	.020		-	2.8	7	-			8.7
7.7	8.4	8.6	1.23	.120	10.2	-	0.6	-	-			9.6
5A1a	5B1a	CATIONS				5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A
CATION EXCHANGE CAPACITY NEq, OAc	EXTRACTABLE		EXCHANGEABLE				EXCH. Na %	6F1a	6Q1a			MOISTURE AT SATURATION %
	6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K	Na		K	milliequivalents per liter			
	← milliequivalents per 100g. soil →											
25.6	18.1	4.0		0.4	3.3	2	-	-				47.2
26.4	19.8	3.9		0.5	2.6	2	-	0.4				47.0
27.1				0.4	2.8	2	0.9	0.7				44.9
23.4				0.9	3.6	4	4.5	0.7				44.8
20.3				1.7	3.3	8	10.4	-				42.4
18.9				1.7	3.0	9	28.6	1.0				39.6
21.5	20.3	3.9		0.5	1.8	2	1.1	0.3				36.2

a. Composite irrigated surface sample from NW1/4 SW1/4 NW1/4 Sec. 14, T23N, R61W.

Soil type: Colby loam

Soil No.: S50Wyo-8-3

Location: Northeast quarter of southeast quarter of northwest quarter of Section 32, T24N, R61W, Goshen County, Wyo.

Vegetation: Virgin pasture; good cover of blue grama, threadleaf sedge, needlegrass, weeds and herbs.

Physiographic position: Nearly level, high terrace-like position.

Parent material: Apparently a late loess deposit on a rock terrace.

Described by: W. M. Johnson.

Horizon and

Mandan

Lab. Number

A11 520	0 to 3½ inches. Light brownish gray (10YR 5.5/2 dry) to dark grayish brown (10YR 4/2 moist), soft, friable, weak coarse and medium granular loam; roots very numerous; noncalcareous; boundary indistinct.
A12 521	3½ to 8 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) soft, friable, coarse silt loam; weak subangular blocks break to weak coarse granules; noncalcareous; grass roots numerous; indistinct boundary.
B2 522	8 to 19 inches. Light brownish gray (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2 moist) slightly hard, friable, silt loam; weak prisms crush to weak coarse granules; noncalcareous; moderate number of grass roots; clear boundary.
C1ca 523	19 to 36 inches. White (10YR 8/2 dry) to pale brown (10YR 6/3 moist) slightly hard, friable, weak prismatic silt loam; strongly calcareous; few roots; gradual boundary.
C2ca 524	36 to 43 inches. White (10YR 8/2 dry) to pale brown (10YR 6/3 moist) massive, soft, friable, coarse silt loam; strongly calcareous; very few roots; diffuse boundary.
C3ca 525	43 to 56 inches. Light gray (10YR 7/2 dry) to light brownish gray (10YR 6/2.5 moist) massive, soft friable, coarse silt loam; strongly calcareous; very few roots.

SOIL TYPE *Creighton LOCATION Goshen County, Wyoming
 very fine sandy loam

SOIL NOS. S54Wyo-8-4 LAB. NOS. 2539-2545

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	0.02-0.001	< 0.001		
0-2 1/2	A1	0.3a	3.6	3.6	14.2	52.7	15.1	10.5	73.8	4.6	-	vfs1	
2 1/2-6	B1	0.5	4.6	3.4	12.4	54.4	15.6	9.1	73.8	5.9	-	vfs1	
6-12 1/2	B21t	1.2	5.4	3.6	13.5	49.7	13.6	13.0	69.2	4.6	1	vfs1	
12 1/2-17	B22t	0.4	3.3	3.0	12.7	48.7	19.7	12.2	70.2	7.9	-	vfs1	
17-25	B3ca	0.3	2.5	3.2	12.9	48.7	20.7	11.7	71.2	8.2	-	vfs1	
25-37	C1ca	0.2	3.7	4.5	14.7	47.6	18.9	10.4	71.3	6.1	-	vfs1	
37-48	C2ca	2.2	13.6	9.4	19.0	35.4	10.2	10.2	55.0	3.7	4	vfs1	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM @25-C.		6E1a		MOISTURE TENSIONS		4B2
8C1b	8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)		CoCO ₃ equiv-alemt	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
	1:5	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N			%		%	%	%	
6.7	7.1	7.2	1.43	.103	13.9	-	-	-	-	-	-	6.0	
7.0	7.3	7.3	1.08	.088	12.3	-	-	-	-	-	-	6.0	
7.3	7.9	7.9	0.82	.081	10.1	-	-	-	-	-	-	6.7	
8.0	8.7	8.8	0.68	.067	10.1	-	-	6	-	-	-	7.6	
7.9	8.8	9.0	0.42	.047	8.9	-	-	7	-	-	-	7.5	
8.1	9.0	9.2	0.21			-	-	5	-	-	-	6.2	
8.0	9.1	9.3	0.11			-	-	3	-	-	-	4.6	
5A1a		EXTRACTABLE CATIONS				5B1a	SATURATION EXTRACT SOLUBLE					MOISTURE AT SATURATION %	
CATION EXCHANGE CAPACITY (NH4Ac)	6N2b	6O2b		6P2a	6Q2a	BASE SAT. %							
	Ca	Mg	H	Na	K		Na	K					
	milliequivalents per 100g. soil					5C1	milliequivalents per liter						
12.3	9.3	1.9		0.1	0.9	99							
13.6	11.5	1.7		0.1	0.8								
16.5	15.0	1.6		0.1	0.8								
15.6				0.1	0.8								
14.8				0.1	0.9								
13.8				0.1	1.1								
11.1				0.1	1.0								

a. Organic matter in sand fraction.

Soil type: *Creighton very fine sandy loam

Soil No.: 854Wyo-8-4

Location: Goshen County, Wyoming; near southeast corner of northeast quarter of southeast quarter of Section 19, T19N, R63W.

Physiographic position: Upland.

Topography: Gentle convex slope of approximately 3 percent facing northeast.

Drainage: Well drained.

Vegetation: Principally short grasses, grama, western wheatgrass and needlegrass.

Use: Pasture.

Collected by: James Allen, Charles Fox, E. F. Brunkow, and A. J. Cline, August 31, 1954.

Described by: A. J. Cline.

Horizon and

Lincoln

Lab. Number

- A1
2539 0 to 2½ inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) very fine sandy loam; soft when dry, very friable when moist; weak very fine granular structure; noncalcareous; lower boundary clear and smooth.
- B1
2540 2½ to 6 inches. Grayish brown (10YR 5/2.5 dry) to very dark grayish brown (10YR 3/2 moist) very fine sandy loam; hard when dry, friable when moist; weak coarse subangular blocky structure; noncalcareous; lower boundary gradual and smooth.
- B2t
2541 6 to 12½ inches. Grayish brown (10YR 5/2.5 dry) to very dark grayish brown (10YR 3/2 moist) heavy fine sandy loam; hard when dry, friable when moist; weak coarse prismatic breaking to weak coarse subangular blocky; noncalcareous; there are a few thin patchy clay skins; lower boundary gradual and smooth.
- B2t
2542 12½ to 17 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) heavy fine sandy loam; hard when dry, friable when moist; weak very coarse prismatic breaking to weak coarse subangular blocky; noncalcareous; a few thin patchy clay skins; lower boundary abrupt and smooth.
- B3ca
2543 17 to 25 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/2.5 moist) fine sandy loam; slightly hard when dry, very friable when moist; massive to very weak coarse subangular blocky; calcareous; the horizon contains moderate amounts of accumulated lime principally as small concretions; lower boundary gradual and smooth.
- C1ca
2544 25 to 37 inches. White (2.5Y 8/2 dry) to light yellowish brown (2.5Y 6/3 moist) light fine sandy loam; slightly hard when dry, very friable when moist; massive; calcareous; the horizon contains moderate amounts of accumulated calcium carbonate chiefly as lime flour; lower boundary gradual and smooth.
- C2ca
2545 37 to 48 inches. White (2.5Y 8/2 dry) to light yellowish brown (2.5Y 6/3 moist) light fine sandy loam; slightly hard when dry, very friable when moist; massive; calcareous; the horizon contains moderate amounts of accumulated lime chiefly as lime flour but has somewhat less than the horizon above.

SOIL TYPE *Creighton LOCATION Goshen County, Wyoming
loamy fine sand

SOIL NOS. S54Wyo-8-5 LAB. NOS. 2546-2553

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				
0-2	A1	0.2a	1.4	1.5	18.9	58.5	11.1	8.4	83.1	2.9	-	lfs
2-5 1/2	B1	0.1	0.9	1.3	20.0	58.5	7.8	11.4	81.6	1.9	-	lfs
5 1/2-8 1/2	B21t	0.3	1.9	1.8	16.9	55.5	9.4	14.2	77.1	2.9	1	vfs1
8 1/2-16	B22t	0.2	1.2	1.3	15.6	56.1	12.9	12.7	79.0	4.4	-	vfs1
16-19	B3ca	0.1	0.5	0.6	11.8	52.1	21.2	13.7	76.0	8.3	-	vfs1
19-26	C1ca	0.1	0.4	0.3	7.3	48.8	31.7	11.4	73.1	14.2	-	vfs1
26-35	C2ca	-	0.4	0.4	7.7	50.8	29.2	11.5	74.5	12.7	-	vfs1
35-48	C3ca	0.2	0.9	0.9	12.3	53.0	21.6	11.1	77.2	9.0	-	vfs1
pH		ORGANIC MATTER				8A2	6E1a		MOISTURE TENSIONS			
8C1b SATURATED PASTE	8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC * 10 ³ MILLIMHOS PER CM @ 25°C.	CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N			%		%	%	%
6.8	7.3	7.3	1.16	.095	12.2	-		-				4.9
7.0	7.4	7.4	1.00	.088	11.4	-		-				6.1
7.1	7.5	7.5	0.96	.086	11.2	-		-				6.9
7.4	7.9	7.8	0.65	.067	9.7	-		-				6.5
7.9	8.5	8.7	0.73	.067	10.9	-		4				8.5
8.1	9.0	9.2	0.30	-		-		9				10.5
8.2	8.9	9.2	0.22	-		-		9				9.2
8.2	9.0	9.3	0.18	-		-		6				7.1
5A1a CATION EXCHANGE CAPACITY (NH ₄ Ac)	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	SATURATION EXTRACT SOLUBLE				MOISTURE AT SATURATION %	
	6N2b	6O2b	6P2a		6Q2a		Na	K				
	Ca	Mg	H	Na	K							
	milliequivalents per 100g. soil					5C1	milliequivalents per liter					
10.8	8.0	1.7		0.1	0.9	99						
14.1	11.5	2.0		0.1	0.9							
17.0	13.8	2.2		0.1	1.1							
16.5	13.9	2.2		0.1	1.1							
17.3				0.1	1.4							
17.7				0.1	1.7							
16.1				0.1	1.7							
14.2				0.2	1.6							

a. Organic matter in sand fraction.

Soil type: *Creighton loamy fine sand

Soil No.: S54Wyo-8-5

Location: Goshen County, Wyoming; approximately southeast corner of southeast quarter of northwest quarter of Section 21, T19N, R64W.

Physiographic position: Upland.

Topography: Gentle convex slope approximately 4 percent facing south.

Drainage: Well drained.

Vegetation: Chiefly blue grama, some buffalograss, western wheatgrass and needlegrass.

Use: Pasture.

Collected by: James Allen, Charles Fox, E. F. Brunkow, and A. J. Cline, August 31, 1954.

Described by: A. J. Cline.

Horizon and

Lincoln

Lab. Number

- A1 0 to 2 inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) fine sandy loam; soft when dry, very friable when moist; weak very fine granular structure; noncalcareous; lower boundary clear and smooth.
2546
- B1 2 to 5½ inches. Grayish brown (10YR 5/2.5 dry) to very dark grayish brown (10YR 3/2 moist) fine sandy loam; slightly hard when dry, friable when moist; weak medium subangular blocky structure; noncalcareous; lower boundary clear and smooth.
2547
- B21t 5½ to 8½ inches. Dark grayish brown (10YR 4/2 dry) to very dark grayish brown (10YR 3/2 moist) heavy fine sandy loam; hard when dry, friable when moist; weak to moderate coarse prismatic breaking to weak to moderate coarse subangular blocky; noncalcareous; the horizon has a few thin patchy clay skins; lower boundary is gradational and smooth.
2548
- B22t 8½ to 16 inches. Brown (10YR 5/2.5 dry) to dark brown (10YR 4/2.5 moist) heavy fine sandy loam; hard when dry, friable moist; weak to moderate coarse prismatic breaking to weak to moderate coarse subangular blocky; noncalcareous; lower boundary abrupt and smooth.
2549
- B3ca 16 to 19 inches. Very pale brown (10YR 7/2.5 dry) to brown (10YR 5/2.5 moist) fine sandy loam; slightly hard when dry, friable when moist; weak coarse subangular blocky; calcareous; the horizon contains a few small calcium carbonate concretions; lower boundary is gradual and smooth.
2550
- C1ca 19 to 26 inches. Pale yellow (2.5Y 8/3 dry) to light olive brown (2.5Y 5/3 moist) fine sandy loam; very hard when dry, firm when moist; massive; calcareous; the horizon contains large amounts of accumulated lime, principally as lime flour but with a few small concretions; lower boundary is gradational and irregular.
2551
- C2ca 26 to 35 inches. Pale yellow (2.5Y 8/3 dry) to light olive brown (2.5Y 5/3 moist) light fine sandy loam; slightly hard when dry, friable when moist; massive; calcareous; the horizon contains moderate amounts of accumulated calcium carbonate chiefly as lime flour; lower boundary is gradational and irregular.
2552
- C3ca 35 to 48 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) light fine sandy loam; slightly hard when dry, very friable when moist; massive; calcareous; this horizon grades downward into fine grained Tertiary sandstone.
2553

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Dunday **LOCATION** Goshen County, Wyoming
loamy fine sand

SOIL NOS. S53Wyo-8-4 **LAB. NOS.** 1901-1906

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		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 1/2	Alp	2.5	10.4	9.2	26.8	33.3	9.3	8.5	59.4	2.2		lfs
5 1/2-13	B21	3.7	12.9	12.4	23.7	25.9	10.5	10.9	47.6	3.8	Tr.	fs1
13-20 1/2	B22	3.8	14.4	15.0	28.5	22.7	8.0	7.6	45.8	3.0	-	ls
20 1/2-27	B3	3.0	11.7	16.2	36.0	23.7	4.4	5.0	49.9	1.6	Tr.	s
27-46	C1	2.0	16.2	20.8	35.9	18.5	3.2	3.4	41.9	1.6	-	s
46-60	C2	0.7	10.6	20.0	40.6	21.4	3.3	3.4	48.3	1.4	-	s
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
8C1b	8C1a	8C1a	6A1a	NITROGEN		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv- alent	GYPSUM mg./100g. SOIL	4B1a	4B1a	4B2
SATURATED PASTE	1:5	1:10	ORGANIC CARBON %	C/N			8A1a	%	%	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
7.4	7.4	7.4	0.67			<0.20	0.8	-	-	17.2	10.1	4.5
7.4	7.5	7.6	0.45			<0.20	0.6	-	-	18.2	11.0	5.9
7.7	7.5	7.6	0.23			<0.20	0.6	-	-	13.7	8.4	4.4
7.9	8.4	8.4	0.16			<0.20	0.5	1	-	7.9	5.1	3.0
8.1	8.6	8.7	0.09			<0.20	0.5	3	-	7.0	4.4	2.6
8.1	8.8	8.8	0.05			<0.20	0.5	3	-	6.8	4.3	2.6
5A1a	5B1a	CATIONS				5D2	SAL SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY (NH ₄ OAc)	EXTRACTABLE		EXCHANGEABLE		EXCH. No %	6P1a	6Q1a			MOISTURE AT SATURATION %		
	6N2b Ca	6O2b Mg	H	6P2a Na		6Q2a K	Na	K	milliequivalents per liter			
	← milliequivalents per 100g. soil →											
9.3	8.0	1.0		0.1	1.2	1	0.6	1.8			29.5	
11.3	9.6	1.6		0.1	1.0	1	0.6	0.8			28.3	
9.1	8.3	1.2		0.1	0.6	1	0.9	0.6			22.4	
6.6	11.3	1.0		0.1	0.3	2	0.6	0.4			22.0	
4.2				0.2	0.3	5	0.6	0.6			21.2	
4.7				0.1	0.3	2	0.6	0.4			22.5	

Soil type: Dunday loamy fine sand

Soil No.: 853Wyo-8-4

Location: Goshen County, Wyoming; southwest corner of southwest quarter of northwest quarter of Section 20, T22N, R61W; about 550 feet northeast of west quarter corner; photo 12-32.

Slope: 2 percent upland slope; convex, faces south; well drained.

Vegetation: Cultivated; crested wheat.

Parent material: Eolian sands, probably mainly from Lance (cretaceous) sandstones.

Described by: C. J. Fox, September 24, 1953.

Horizon and

Mandan

Lab. Number

- A1p
1901 0 to 5½ inches. Dark brown (10YR 4/3 dry) or dark grayish brown (10YR 4/2 moist) noncalcareous loamy fine sand with single grain and weak fine crumb structure; friable when moist, slightly hard when dry; roots abundant; clear smooth boundary.
- B21
1902 5½ to 13 inches. Dark brown (10YR 4/3 dry) or very dark grayish brown (10YR 3/2 moist) noncalcareous friable very coarse moderately developed prismatic fine sandy loam; crushes to single grains and fine weak granules; very hard when dry; many fine roots; gradual smooth boundary.
- B22
1903 13 to 20½ inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/3 moist) noncalcareous friable coarse weak prismatic fine sandy loam; crushes to single grains; many fine roots; gradual smooth boundary.
- B3
1904 20½ to 27 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) moderately calcareous slightly coherent loamy fine sand; some fine grass roots; gradual smooth boundary.
- C1
1905 27 to 46 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) moderately calcareous slightly coherent loamy fine sand; some fine roots; diffuse boundary.
- C2
1906 46 to 60 inches. Very pale brown (10YR 7/3 dry) or brown (10YR 5/3 moist) moderately calcareous slightly coherent fine sand.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Dwyer **LOCATION** Goshen County, Wyoming
loamy fine sand

SOIL NOS. S53Wyo-8-6 **LAB. NOS.** 1914-1919

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1					2A2		> 2 (<19mm)	
		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	0.2-0.02	0.02-0.002				
0-6	Ap	4.8	10.3	8.9	22.9	35.3	10.2	7.6	58.5	3.2	1	lfs
6-12	AC	3.5	9.3	10.0	26.8	33.4	9.9	7.1	59.2	2.8	Tr.	lfs
12-17	C1	2.2	8.5	9.9	28.2	34.3	10.1	6.8	61.1	3.3	Tr.	lfs
17-26	C2	1.4	8.3	11.2	34.3	31.6	7.4	5.8	61.3	1.7	Tr.	lfs
26-44	C3	0.4	8.3	12.6	36.4	31.8	6.4	4.1	62.4	1.4	Tr.	fs
44-58	C4	1.1	10.8	15.0	35.7	28.4	5.4	3.6	56.1	2.2	Tr.	vfs
pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS			
8C1b SATURATED PASTE	8C1a	8C1a	6A1a		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv- alent	GYPSUM me./100g. SOIL	4B1a	4B1a	4B2	
1:5	1:10	ORGANIC CARBON	NITRO-GEN	C/N			%	me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
		%	%				%		%	%	%	
7.8	8.4	8.4	0.38		<0.20	0.5	-		18.3	9.0	4.3	
7.7	8.2	8.5	0.34		<0.20	0.5	1		15.9	8.1	4.2	
7.8	8.4	8.5	0.24		<0.20	0.5	2	-	14.4	8.0	4.0	
8.0	8.5	8.6	0.23		<0.20	0.5	3	-	13.2	7.4	3.8	
8.0	8.7	8.8	0.12		<0.20	0.5	3	-	11.2	6.0	3.2	
8.1	8.8	8.9	0.05		<0.20	0.5	3	-	9.8	5.2	2.5	
5A1a	5B1a	CATIONS			5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE			EXCH. No %	6P1a	6Q1a			MOISTURE AT SATURATION %	
	Ca	Mg	H	Na	K		Na	K				
	milliequivalents per 100g. soil						milliequivalents per liter					
9.4		1.3		0.2	0.7	2	0.6	0.4			29.6	
9.5		1.3		0.2	0.5	2	0.6	0.2			30.5	
9.0		1.3		0.2	0.5	2	0.9	0.4			26.8	
7.3		1.2		0.2	0.4	3	0.9	0.4			28.7	
6.5		1.2		0.2	0.4	3	0.9	0.4			25.4	
5.9				0.4	0.4	7	0.9	0.6			25.4	

Soil type: Dwyer loamy fine sand
 Soil No.: S53Wyo-8-6
 Location: Goshen County, Wyoming; extreme southwest corner of the southeast quarter of Section 7, T21N, R61W; 50 feet north of road; photo 12-26.
 Vegetation: Cultivated; wheat stubble.
 Slope: 2 percent upland; convex, faces northeast; well drained.
 Parent material: Eolian sands, derived largely from Lance sandstone (cretaceous).
 Note: Profile dry when examined.
 Described by: C. J. Fox, September 25, 1953.

Horizon and

Mandan

Lab. Number

Ap 1914	0 to 6 inches. Brown (10YR 5/3 dry) or dark grayish brown (10YR 4/2 moist) slightly calcareous friable angular blocky loamy fine sand containing some quartzitic coarse sand and gravel; crushes to single grains and weak fine granules; hard when dry; many fine roots; abrupt smooth boundary.
AC 1915	6 to 12 inches. Dark grayish brown (10YR 4/2 dry) or very dark grayish brown (10YR 3/2 moist) non-calcareous friable very coarse weak prismatic fine sandy loam; breaks to medium moderately developed angular blocks that crush to single grains; some fine roots; clear smooth boundary.
C1 1916	12 to 17 inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/3 moist) moderately calcareous friable medium weak angular blocky fine sandy loam; crushes to single grains; some fine roots; clear wavy boundary.
C2 1917	17 to 26 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) strongly calcareous slightly coherent loamy fine sand containing an occasional quartz pebble; few fine roots; gradual wavy boundary.
C3 1918	26 to 44 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) strongly calcareous slightly coherent single grained loamy fine sand; diffuse smooth boundary.
C4 1919	44 to 58 inches. Very pale brown (10YR 7/3 dry) or brown (10YR 5/3 moist) strongly calcareous single grained loamy fine sand which is only slightly coherent; abrupt smooth boundary.
IIR	58 inches plus. (Not sampled) Yellowish clay shale of Lance formation.

SOIL SURVEY LABORATORY

Lincoln, Nebr.

August 1959

SOIL TYPE

Ft. Collins

LOCATION

Platte County, Wyoming

fine sandy loam

SOIL NOS.

S58Wyo-16-1

LAB. NOS.

9244-9253

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		2A2 0.02-0.002 (<19mm)		
0-1	A11	0.8	7.9	9.0	23.7	26.5	19.7	12.4	55.4	5.5	Tr.	fsl	
1-3 1/2	A12	2.1	11.7	13.4	32.7	24.9	9.1	6.1	50.9	3.1	3	ls	
3 1/2-6	AB	1.5	10.0	12.4	28.5	20.5	12.3	14.8	45.2	4.5	3	fsl	
6-11	B2t	0.6	5.4	7.2	14.5	14.5	32.2	25.6	42.9	12.0	Tr.	l	
11-16	B3ca	0.4	1.9	3.1	7.6	13.7	45.5	27.8	44.9	18.8	Tr.	cl	
16-26	Cca1	0.2a	1.2a	2.4a	7.5a	18.8a	43.9	26.0	51.2	16.3	Tr.	l	
26-36	Cca2	0.1a	0.6a	2.1a	8.4a	24.8a	41.5	22.5	58.1	13.6	Tr.	l	
36-43	B2b	0.8b	3.4b	4.4b	12.9b	25.6b	33.4	19.5	55.8	11.1	8	l	
43-50	B3cab	2.8b	7.1b	10.3b	22.2b	20.2b	18.5	18.9	44.8	7.7	12	fsl	
50-62	Cca	14.8b	14.5b	11.7b	18.6b	10.6b	11.6	18.2	26.0	7.0	18	cosl	
pH		8C1a	ORGANIC MATTER			8A2	ELECTRI- CAL CONDUCT- IVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a	6F1a	MOISTURE TENSIONS			
	1:5	1:10	6A1a ORGANIC CARBON	6B1a NITRO- GEN	C/N	EST% SALT (BUREAU CUP)	CoCO ₃ equiv- alent	GYPSUM me./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	4B2 %	
	7.6	7.9	8.0	1.56	0.126	12.4	<0.20	0.7	<1			5.9	
	7.9	8.1	8.1	0.86	0.066	13	<0.20	0.4	<1			2.7	
	8.0	8.2	8.3	0.72	0.079	9	<0.20	0.5	<1			6.3	
	8.0	8.4	8.8	0.98	0.103	10	<0.20	0.5	4			10.4	
	8.2	8.7	9.0	0.72	0.079	9	<0.20	0.5	17			10.7	
	8.4	8.9	9.2	0.40	0.049	8	<0.20	0.6	14			9.5	
	8.7	9.3	9.6	0.15			<0.20	1.1	11			8.0	
	8.6	9.2	9.5	0.14			<0.20	3.0	7	<1		7.1	
	8.2	8.6	8.9	0.18			0.52	8.0	18	1		7.3	
	8.2	8.5	8.8	<0.01			0.45	7.2	22	3		5.9	
5A1a		EXTRACTABLE CATIONS					5B1a	5D2	SAT. EXT. SOL.	8A1	4B4	4A1a	8A
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a	Field- State Water %	Bulk Den- sity g/cc	MOISTURE AT SATU- RATION %		
	Ca	Mg	H	No	K		Na	K					
← milliequivalents per 100g. soil →													
11.5	11.7	1.6	1.6	<0.1	1.1	<1	0.2	1.0			44.9		
6.2	6.0	0.8	0.8	<0.1	0.4	<1	0.3	0.4			33.6		
12.3	11.0	1.8	2.8	<0.1	0.6	<1	0.3	0.4	15.5	1.54	36.9		
18.1		4.4	<0.1	0.1	0.8	<1	0.3	0.3	8.1	1.46	51.7		
16.7		5.7	<0.1	0.1	0.6	<1	0.5	0.3	7.9	1.58	54.6		
14.7		7.9	<0.1	0.4	0.4	2	1.6	0.2			48.2		
14.1		10.7	<0.1	1.6	0.3	9	6.9	0.1			48.0		
13.1		11.4	<0.1	2.4	0.3	12	17.2	0.2			45.1		
8.5		9.4	<0.1	2.8	0.2	15	37.0	0.2			40.9		
5.1		6.1	<0.1	2.0	0.2	16	34.3	0.2			34.2		

a. Few CaCO₃ coner.
b. Common CaCO₃ coner.

Soil type: Ft. Collins fine sandy loam

Soil No.: S58Wyo-16-1

Location: Platte County, Wyoming; starting at corner fence post which is approximately 115 feet northeast of the southwest corner of section, then north along fence 849 feet and east 337 feet, in northwest quarter of southwest quarter of southwest quarter, Section 9, T24N, R67W.

Physiographic position: High terrace.

Topography: Nearly level, 1 percent slope, southeast aspect.

Drainage: Well drained.

Vegetation: Blue grama grass and cacti.

Use: Pasture.

Collected by: James Allen, Keith Young, A. J. Cline, and Fraser Stephens, October 7, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and

Lincoln

Lab. Number

- A11
9244 0 to 1 inch. Grayish brown (10YR 5/2 dry) to very dark grayish brown or dark grayish brown (10YR 3.5/2 moist) fine sandy loam; soft when dry, very friable when moist; weak very fine granular structure; noncalcareous; lower boundary abrupt and smooth.
- A12
9245 1 to 3½ inches. Grayish brown or brown (10YR 5.5/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) loamy sand; soft when dry, very friable when moist; weak fine subangular blocky structure breaking to moderate very fine granules; noncalcareous; lower boundary clear and smooth.
- AB
9246 3½ to 6 inches. Light brownish gray or pale brown (10YR 6/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) light sandy clay loam; hard when dry, friable when moist; very weak coarse prismatic structure breaking to weak coarse subangular blocks; noncalcareous; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; lower boundary clear and smooth.
- B2t
9247 6 to 11 inches. Light brownish gray or pale brown (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2 moist) sandy clay loam; hard when dry, friable when moist; moderate medium prismatic structure breaking to moderate to strong medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; lower boundary clear and wavy.
- B3ca
9248 11 to 16 inches. Light brownish gray (1.25Y 6/2 dry) to grayish brown (1.25Y 5/2.5 moist) light clay loam; hard when dry, friable when moist; very weak medium prismatic structure breaking to weak to moderate medium and fine subangular blocks; violently calcareous; there are a few thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; this is a weak to moderate horizon of lime accumulation with visible lime occurring as concretions and in finely divided forms; lower boundary gradual and wavy.
- Coa1
9249 16 to 26 inches. Light gray (2.5Y 7/2 dry) to light olive brown (2.5Y 5/3 moist) light clay loam; very hard when dry, firm when moist; very weak medium subangular blocky structure; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in finely divided forms; there are moderate number of insect casts approximately one-half inch in diameter; lower boundary diffuse and smooth.
- Coa2
9250 26 to 36 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) fine sandy clay loam; hard when dry, friable when moist; weak medium subangular blocky structure; violently calcareous; this is a moderate horizon of lime accumulation with visible lime occurring mostly in divided forms; there are many insect casts approximately one-half inch in diameter; lower boundary gradual and wavy.
- B2b
9251 36 to 43 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) fine sandy clay loam; hard when dry, friable when moist; weak coarse prismatic structure breaking to weak to moderate coarse and medium subangular blocks; calcareous with the inside of the aggregates being less calcareous than their surface; there are a few insect casts in this horizon; there are also a few thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; lower boundary clear and wavy.
- B3cab
9252 43 to 50 inches. Light gray (10YR 7/2 dry) to pale brown (10YR 6/3 moist) sandy loam; slightly hard when dry, very friable when moist; massive; violently calcareous; lower boundary clear and smooth.
- Coa
9253 50 to 62 inches. White (10YR 8/2 dry) to very pale brown (10YR 7/3 moist) sandy loam; very hard when dry, friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in finely divided forms; lower boundary gradual and smooth.
- D 62 inches plus. Sand and gravel with little fine material; this horizon contains some accumulated lime but less than in the horizon above and mainly as coatings on the surfaces of sand and gravel. Rocks in this horizon are principally granitic rocks but there is a small percentage of metamorphic rock as well. This horizon not sampled for laboratory study.

SOIL TYPE Ft. Collins LOCATION Platte County, Wyoming
 fine sandy loam

SOIL NOS. S58Wyo-16-2 LAB. NOS. 9254-9263

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											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		
0-1 1/2	A11	1.5	8.0	9.4	22.3	29.8	17.8	11.2	57.1	5.7	Tr.	fsl/vfsl	
1 1/2-3	A12	2.1	13.5	14.4	29.2	24.5	10.1	6.2	50.2	3.5	3	ls	
3-5	AB	1.0	7.5	11.6	28.6	26.3	11.3	13.7	52.3	4.7	7	fsl	
5-8	B21t	0.3	5.1	9.0	21.3	22.0	15.3	27.0	45.7	5.4	Tr.	scl	
8-12	B22t	0.4	3.9	6.4	16.3	24.2	25.0	23.8	52.0	8.1	Tr.	scl	
12-16	B3ca	0.5	2.7	4.4	15.4	27.6	28.0	21.4	56.6	10.2	Tr.	l/scl	
16-26	Cca1	0.4a	2.2a	3.3a	12.4a	24.9a	35.4	21.4	56.6	12.1	Tr.	l	
26-31	Acab	0.5a	4.2a	5.5a	15.0a	24.8a	31.5	18.5	53.2	12.5	Tr.	l	
31-38	Cca2	3.2b	8.6b	10.0b	23.7b	21.0b	16.7	16.8	45.0	6.5	17	fsl	
38-50+	Cca3	3.9a	7.2a	7.7a	21.6a	18.9a	16.7	24.0	40.0	8.6	13	scl	
		8C1a		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY		6E1a		MOISTURE TENSIONS	
		1:5	1:10	ORGANIC CARBON	NITROGEN	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv-olent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATM. S.	15 ATMOS.
				%	%			6A1a	%		%	%	%
7.7	8.0	8.0	1.47	0.117	12.5	< 0.20	0.6	Δ					5.6
7.8	8.0	8.0	0.81	0.082	10	< 0.20	0.4	Δ					3.3
7.7	7.8	8.1	0.88	0.085	10	< 0.20	0.5	Δ					5.2
7.6	7.8	8.1	1.01	0.113	9	< 0.20	0.5	Δ					10.8
7.8	8.2	8.5	0.76	0.085	9	< 0.20	0.4	Δ					9.8
8.1	8.6	9.0	0.56	0.061	9	< 0.20	0.5	11					8.2
8.3	8.8	9.0	0.41	0.044	9	< 0.20	0.5	12					8.0
8.3	8.8	9.1	0.29			< 0.20	0.5	9					6.8
8.3	8.9	9.2	0.22			< 0.20	0.6	11					5.7
8.5	9.1	9.3	0.22			< 0.20	0.8	30					6.8
	5A1a	EXTRACTABLE CATIONS					5B1a	5D2	SATURATION EXTRACT SOL.			8A	
		6N2b	6O2b	6H1a	6P2a	6Q2a		6P1a	6Q1a				MOISTURE AT SATURATION
		Ca	Mg	H	Na	K	EXCH. No %	No	K				%
		milliequivalents per 100g. soil						milliequivalents per liter					
10.8	11.2	1.9	0.8	0.1	0.8	1	0.2	0.6					41.4
6.6	5.4	1.3	1.2	< 0.1	0.6	Δ	0.2	0.4					33.5
11.3	8.8	2.6	1.2	< 0.1	0.6	Δ	0.2	0.3					39.8
21.2	17.0	4.2	1.6	0.1	0.9	Δ	0.5	0.2					50.9
18.6	20.1	3.4	0.8	0.2	0.7	1	1.0	0.2					49.0
12.4		2.6	0.1	0.3	0.4	2	1.4	0.2					44.4
13.1		3.9	0.1	0.3	0.4	2	1.6	0.1					43.8
12.2		4.7	0.1	0.3	0.4	2	1.5	0.1					39.9
9.3		4.1	0.1	0.2	0.2	2	1.4	0.1					34.8
6.0		6.0	0.1	0.2	0.1	2	1.8	0.2					35.3

a. Few CaCO₃ coner.
 b. Common CaCO₃ coner.

Soil type: Ft. Collins fine sandy loam

Soil No.: 858Wyo-16-2

Location: Platte County, Wyoming; starting at southeast corner of section, then north 1184 feet and west 266 feet in northeast quarter of southeast quarter of southeast quarter of Section 13, T24N, R68W.

Physiographic position: High terrace.

Topography: Nearly level, 1 percent slope, northeast aspect.

Drainage: Well drained.

Vegetation: Blue grama grass, buffalograss, fringe sagewort, green sagewort, and wild buckwheat.

Use: Pasture.

Collected by: James Allen, Keith Young, A. J. Cline, and R. C. Kronenberger, October 7, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and
Lincoln
Lab. Number

- A11
9254 0 to 1½ inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; soft when dry, very friable when moist; moderate very fine granular structure; noncalcareous; lower boundary clear and smooth; horizon temperature 26.5 degrees centigrade.
- A12
9255 1½ to 3 inches. Light brownish gray or pale brown (10YR 6/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) loamy sand; soft when dry, very friable when moist; very weak medium subangular blocky structure breaking to very weak fine granules or single grains; noncalcareous; lower boundary clear and wavy. Temperature of this horizon 27.0 degrees centigrade.
- AB
9256 3 to 5 inches. Grayish brown or brown (10YR 5/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) sandy loam; slightly hard when dry, very friable when moist; weak medium prismatic structure breaking to weak to moderate medium subangular blocks; noncalcareous; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; temperature of this horizon is 26.5 degrees centigrade; lower boundary clear and wavy.
- B21t
9257 5 to 8 inches. Grayish brown or brown (10YR 5/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) sandy clay loam; hard when dry, very friable when moist; moderate medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; horizon temperature 24.0 degrees centigrade; lower boundary clear and wavy.
- B22t
9258 8 to 12 inches. Brown (10YR 5/3 dry) to brown or dark brown (10YR 4/3 moist) light clay loam; very hard when dry, friable when moist; moderate medium prismatic structure breaking to moderate to strong medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; temperature 23.5 degrees centigrade; boundary clear and wavy.
- B3ca
9259 12 to 16 inches. Pale brown or light yellowish brown (1.25Y 6/3 dry) to brown or olive brown (1.25Y 4/3 moist) light clay loam; very hard when dry, friable when moist; weak medium prismatic structure breaking to weak to moderate medium subangular blocks; violently calcareous; this is a very weak horizon of lime accumulation with some visible lime occurring as concretions; few thin patchy clay skins on both the horizontal and vertical faces of soil aggregates; temperature 24.5 degrees centigrade; lower boundary gradual and wavy.
- Cca1
9260 16 to 26 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) very fine sandy clay loam; very hard when dry, friable when moist; weak medium subangular blocky structure; violently calcareous; weak to moderate horizon of lime accumulation with visible lime occurring as concretions and in thin seams and streaks; temperature 22.0 degrees centigrade; lower boundary gradual and wavy.
- Acab
9261 26 to 31 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) very fine sandy clay loam; hard when dry, friable when moist; moderate medium subangular blocky structure; violently calcareous; moderate horizon of lime accumulations with visible lime occurring as concretions and in thin seams and streaks; there are common numbers of insect casts approximately one-half inch in diameter; temperature 22.0 degrees centigrade; lower boundary gradual and wavy.
- Cca2
9262 31 to 38 inches. Light yellowish brown (2.5Y 6/3 dry) to olive brown (2.5Y 4.5/3 moist) light sandy clay loam; slightly hard when dry, very friable when moist; massive; violently calcareous; approximately 5 percent of this horizon is gravel and stone coarse than two inches; this is a moderate horizon of lime accumulation with visible lime occurring as concretions and in thin seams and streaks; horizon temperature 22.0 degrees centigrade; lower boundary gradual and smooth.
- Cca3
9263 38 to 50 inches plus. White (2.5Y 8/2 dry) to pale yellow (2.5Y 7/3 moist) light sandy clay loam; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring mainly in finely divided forms; approximately 10 percent of this horizon is coarse gravel and stone; temperature 20.0 degrees centigrade; this horizon grades downward into a sand, gravel, and cobble substratum.

Note: There may be some difference of opinion as to the horizon designation for the 26- to 31-inch horizon; although this did not appear to have the properties of a textural B horizon, there was no doubt about the increase in the degree of structure. It is believed that this represents an old soil surface which has probably not developed to the point where the paleosol could be considered as having a textural B horizon. Subsequent recharging of the soil with lime from the material above has been responsible for both the color and the accumulation of calcium carbonate within it. It was therefore given this horizon designation in order to make more clear the distinction of this horizon relative to the morphology of the entire profile.

SOIL TYPE

Ft. Collins
fine sandy loam

LOCATION

Platte County, Wyoming

SOIL NOS.

858Wyo-16-3

LAB. NOS.

9264-9268

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			
0-9	Ap	4.4	11.9	11.2	24.1	18.4	14.0	16.0	40.6	6.0	8	fs1
9-15	B2t	1.0	6.2	7.6	17.2	15.9	25.9	26.2	40.0	12.0	Tr.	sl1
15-24	B3ca	2.0a	5.2a	6.3a	18.2a	18.8a	26.0	23.5	45.2	10.9	20	sl1
24-28	Cca1	7.3b	10.5b	9.3b	19.6b	12.3b	15.5	25.5	29.3	9.1	25	sl1
28-44	Cca2	9.1c	10.5c	10.5c	20.5c	12.6c	14.4	22.4	29.9	8.5	27	sl1
	pH	8C1a ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a	MOISTURE TENSIONS			
	1:5	1:10	6A1a ORGANIC CARBON	6B1a NITROGEN	C/N	EST% SALT (BUREAU CUP)		CaCO ₃ equivalent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:1		%	%				%		%	%	
7.8	8.2	8.4	0.93	0.090	10	<0.20	0.7	<1				7.3
7.6	8.1	8.3	0.70	0.082	8	<0.20	0.7	1				11.1
8.1	8.6	8.9	0.68	0.080	8	<0.20	0.7	9				9.7
8.1	8.8	9.0	0.43			<0.20	0.8	32				9.7
8.2	8.8	9.1	0.23			<0.20	0.8	32				8.0
	5A1a	EXTRACTABLE CATIONS				5B1a	5D2	SATURATION EXTRACT SOL.			8A	
	6N2b	6O2b	6H1a	6P2a	6Q2a		6F1a	6Q1a				MOISTURE AT SATURATION
	Ca	Mg	H	Na	K	EXCH. Na %	Na	K				%
	← milliequivalents per 100g. soil →						← milliequivalents per liter →					
15.5	13.5	3.7	1.2	0.2	0.6	1	1.5	0.2				41.3
21.5		5.2	0.8	0.3	0.4	1	1.6	0.1				52.5
14.4		3.7	<0.1	0.3	0.2	1	1.6	0.1				46.9
8.3		2.4	<0.1	0.1	0.1	<1	1.6	0.1				41.4
6.0		2.1	<0.1	0.2	0.1	2	1.6	0.1				37.8

a. Trace CaCO₃ concn.
b. Few CaCO₃ concn.
c. Common CaCO₃ concn.

Soil type: Ft. Collins fine sandy loam

Soil No.: S58Wyo-16-3

Location: Platte County, Wyoming; southwest quarter of northwest quarter of northeast quarter of Section 16, T24N, R68W; beginning at east end of metal culvert in concrete-lined irrigation ditch near north quarter corner of section, then east 695 feet and south 971 feet.

Physiographic position: High terrace.

Topography: Nearly level; 1/2 percent slope, north aspect.

Drainage: Well drained.

Vegetation: Cultivated.

Use: Irrigated cropland; 1958 dry beans.

Collected by: James Allen, Keith Young, A. J. Cline and R. C. Kronenberger, October 7, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and

Lincoln

Lab. Number

Ap 9264	0 to 9 inches. Grayish brown or light brownish gray (10YR 5.5/2 dry) to very dark grayish brown or dark grayish brown (10YR 3.5/2 moist) fine sandy loam; slightly hard when dry, very friable when moist; weak medium and fine subangular blocky structure breaking to weak very fine granules; noncalcareous; temperature 18.5 degrees centigrade; lower boundary abrupt and smooth.
E2t 9265	9 to 15 inches. Brown or pale brown (10YR 5.5/3 dry) to brown or dark brown (10YR 4/3 moist) sandy clay loam; hard when dry, friable when moist; moderate medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin continuous clay skins on the surfaces of the soil aggregates; temperature 16.5 degrees centigrade; lower boundary clear and smooth.
B3ca 9266	15 to 24 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) sandy clay loam; hard when dry, friable when moist; weak to moderate medium subangular blocky structure; strongly calcareous; this is a weak horizon of lime accumulation with some visible lime occurring as small concretions; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; horizon temperature 15.5 degrees centigrade; there is some coarse gravel in the lower part of this horizon; lower boundary gradual and smooth.
Cca1 9267	24 to 28 inches. Pale yellow (2.5Y 7/3 dry) to light yellowish brown (2.5Y 6/3 moist) gravelly sandy loam; slightly hard when dry, very friable when moist; massive; violently calcareous; approximately 10 percent of this horizon is stone and gravel; this is a moderate to strong horizon of lime accumulation with visible lime occurring as concretions and in finely divided forms; horizon temperature 15.5 degrees centigrade; lower boundary diffuse and wavy.
Cca2 9268	28 to 44 inches. White (2.5Y 8/2 dry) to pale yellow (2.5Y 7/3 moist) gravelly sandy loam; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in finely divided forms; approximately 15 percent of this horizon is stone and gravel; horizon temperature 15.5 degrees centigrade; this horizon grades to substratum of clean sand, gravel, and cobble.

Note: Samples taken 3:25 p.m. October 7 with an air temperature of 21.5 degrees centigrade.

SOIL TYPE Ft. Collins

LOCATION Platte County, Wyoming

fine sandy loam

SOIL NOS.

858Wyo-16-5

LAB. NOS.

9274-9282

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)							
0-8	Ap	1.5	6.4	10.3	23.7	24.1	16.0	18.0	50.2	5.4	6	fsl						
8-12	B21t	0.4a	3.3a	6.2a	14.7a	21.8a	29.2	24.4	50.8	10.0	Tr.	1						
12-17	B22t	0.2a	1.4a	2.6a	9.2a	22.1a	37.7	26.8	51.9	14.0	Tr.	1/cl						
17-27	B3ca	<0.1	0.8a	1.8a	7.7a	23.9a	40.6	25.2	56.0	13.9	Tr.	1						
27-35	Cca1	0.1a	1.0a	2.2a	11.9a	28.0a	35.6	21.2	60.5	11.5	Tr.	1						
35-43	Cca2	0.9a	5.3a	8.1a	31.6a	27.9a	14.9	11.3	58.9	4.5	Tr.	fsl						
43-46	Alb	0.7a	2.9a	4.6a	18.3a	29.0a	28.3	16.2	60.4	9.0	11	vfs1						
46-52	Cca3	4.8b	8.3b	10.1b	24.5b	19.1b	15.3	17.9	41.6	6.7	21	fs1						
52-65	Cca4	13.4b	13.1b	9.3b	17.9b	11.4b	11.4	23.5	25.4	7.1	27	scl						
pH		8C1a ORGANIC MATTER				8A2		6E1a		MOISTURE TENSIONS								
		6A1a		6B1a		EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	4B2								
		ORGANIC CARBON	NITROGEN	C/N						1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.						
1:1		1:5	1:10	%	%		%	%	%	%	%							
7.9	8.2	8.4	0.97	0.104	9	<0.20	0.9	<1			7.6							
7.8	8.4	8.6	0.70	0.081	9	<0.20	0.6	1			10.0							
8.2	8.7	8.9	0.51	0.064	8	<0.20	0.7	13			9.9							
8.2	8.7	9.0	0.37	0.047	8	<0.20	0.6	12			8.6							
8.2	8.8	9.0	0.22			<0.20	0.6	10			7.5							
8.4	9.0	9.2	0.10			<0.20	0.5	3			4.1							
8.3	9.0	9.2	0.15			<0.20	0.6	6			5.7							
8.3	9.0	9.2	0.15			<0.20	0.7	16			6.6							
8.4	9.0	9.2	0.11			<0.20	0.8	23			7.0							
5A1a		EXTRACTABLE CATIONS 5B1a					5D2		SAT. EXT. SOL. 8A1		4B4		4A1a		8A			
CATION EXCHANGE CAPACITY		6N2b		6O2b		6H1a		6P2a		6Q2a		6P1a		6Q1a		Field State Water	Bulk Density g/cc	MOISTURE AT SATURATION %
NEq. Ac		Ca		Mg		H		Na		K		EXCH. No %		K				
		← milliequivalents per 100g. soil →										← me/liter →						
15.4	14.8	3.7	0.8	0.2	0.7	1	1.6	0.4									33.0	
18.5		5.3	<0.1	0.3	0.4	1	1.3	0.1			12.4	1.58					66.6	
15.0		4.8	<0.1	0.3	0.3	1	1.4	0.1									49.7	
14.5		4.7	<0.1	0.3	0.3	1	1.5	0.1			14.4	1.49					50.6	
13.0		3.9	<0.1	0.3	0.3	2	1.7	0.1									45.0	
8.2		2.8	<0.1	0.4	0.2	5	1.7	0.1									32.9	
11.2		3.4	<0.1	0.4	0.2	3	2.2	0.1									40.1	
8.4		3.0	<0.1	0.4	0.2	4	2.6	0.1									35.9	
6.6		3.0	<0.1	0.3	0.1	3	2.7	0.1									38.6	

a. Trace CaCO₃ concr.
b. Few CaCO₃ concr.

Soil type: Ft. Collins fine sandy loam

Soil No.: S98Wyo-16-5

Location: Platte County, Wyoming; northeast quarter of northwest quarter of northwest quarter of Section 17, T24N, R57W; beginning at northwest corner (center of crossroads), then 714 feet east and 366 feet south.

Physiographic position: High terrace.

Topography: Nearly level; 1/2 percent slope, north aspect.

Drainage: Well drained.

Vegetation: Cultivated.

Use: Irrigated cropland; 1958 dry beans.

Collected by: James Allen, Keith Young, A. J. Cline, and R. C. Kronenberger, October 8, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and

Lincoln

Lab. Number

- Ap
9274 0 to 8 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; slightly hard when dry, very friable when moist; weak medium subangular blocky structure breaking to moderate very fine granules; noncalcareous; horizon temperature 16 degrees centigrade; lower boundary clear and smooth.
- E21t
9275 8 to 12 inches. Grayish brown or light brownish gray (10YR 5.5/2 dry) to dark grayish brown or grayish brown (10YR 4.5/2 moist) sandy clay loam or light clay loam; very hard when dry, firm when moist; very weak medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; horizon temperature 15.5 degrees centigrade; lower boundary clear and smooth.
- E22t
9276 12 to 17 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) light clay loam; hard when dry, friable when moist; moderate medium subangular blocky structure; strongly calcareous; this is a weak horizon of lime accumulation with some visible lime occurring as concretions or in thin seams and streaks; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; horizon temperature 15.5 degrees centigrade; lower boundary gradual and smooth.
- E3ca
9277 17 to 27 inches. Light brownish gray or light gray (2.5Y 6.5/2 dry) to grayish brown or light brownish gray (2.5Y 5.5/2 moist) light fine sandy clay loam; hard when dry, very friable when moist; weak to moderate medium and fine subangular blocky structure; violently calcareous; this is a moderate horizon of lime accumulation with visible lime occurring as concretions and in thin seams and streaks; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; horizon temperature 16.0 degrees centigrade; lower boundary gradual and smooth.
- Cca1
9278 27 to 35 inches. Light brownish gray or light gray (2.5Y 6.5/2 dry) to grayish brown or light brownish gray (2.5Y 5.5/2 moist) fine sandy clay loam; hard when dry, very friable when moist; very weak medium subangular blocky structure; violently calcareous; this is a moderate horizon of lime accumulation with visible lime occurring as concretions and in finely divided forms; horizon temperature 16 degrees centigrade; lower boundary gradual and smooth.
- Cca2
9279 35 to 43 inches. Light yellowish brown or pale yellow (2.5Y 6.5/3 dry) to light olive brown or light yellowish brown (2.5Y 5.5/3 moist) sandy loam; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a weak horizon of lime accumulations with visible lime occurring mostly as concretions; horizon temperature 16 degrees centigrade; lower boundary clear and smooth.
- Alb
9280 43 to 46 inches. Light yellowish brown or pale yellow (2.5Y 6.5/3 dry) to light olive brown or light yellowish brown (2.5Y 5.5/3 moist) sandy loam; slightly hard when dry, very friable when moist; massive; strongly calcareous; this is a very weak horizon of lime accumulation and contains only an occasional concretion; there is an appreciable difference in lime between this horizon and the horizon which lies above and below it; horizon temperature 16 degrees centigrade; lower boundary clear and smooth.
- Cca3
9281 46 to 52 inches. White (2.5Y 8/2 dry) to pale yellow (2.5Y 7/3 moist) gravelly sandy loam; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in divided forms; approximately 10 percent of this horizon is gravel and cobble which are concentrated in the surface inches; horizon temperature 17 degrees centigrade; lower boundary clear and wavy.
- Cca4
9282 52 to 65 inches. Pale yellow (2.5Y 7/3 dry) to light yellowish brown (2.5Y 6/3 moist) gravelly sandy clay loam; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in finely divided forms; approximately 20 percent of this horizon is gravel and cobble; horizon temperature 17 degrees centigrade; this grades into clean gravel, sand, and cobble.

Note: Air temperature at the time of sampling 18 degrees centigrade. There will probably be some differences of opinion regarding the horizon designation to place on the 43- to 46-inch horizon; my decision to call this a buried Al horizon stems principally from the lack of lime in this horizon as compared to both the horizons above and those below. It would seem to me that a strong concentration of lime such as we find below this horizon probably represents accumulation during a reasonable time of stability prior to the deposition of the overlying layers; this decision is of course open to question.

SOIL TYPE Ft. Collins
sandy clay loam

LOCATION Platte County, Wyoming

SOIL NOS. 858Wyo-16-6

LAB. NOS. 9283-9289

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS
		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	
0-7	Ap1	1.2	5.1	7.9	23.0	19.2	18.7	24.9	44.7	7.0	5	scl
7-11	Ap2	1.4	4.9	8.0	18.9	18.0	22.3	26.5	44.0	8.5	6	scl
11-16	B2t	0.6	3.2	5.5	12.5	17.5	33.1	27.6	47.2	11.6	Tr.	cl
16-28	B3ca	0.1	1.1	2.4	9.2	22.8	39.4	25.0	54.6	14.2	Tr.	l
28-33	Cca1	1.2	2.3	3.2	10.6	24.7	36.4	21.6	56.3	12.3	5	l
33-38	Cca2	9.7a	12.1a	10.8a	18.7a	13.0a	14.3	21.4	31.2	7.0	22	scl
38-44	Cca3	22.5a	18.8a	10.5a	12.7a	7.6a	10.8	17.1	19.5	5.8	30	cosl
pH		6C1a ORGANIC MATTER				8A2 ELECTRICAL CONDUCTIVITY		6E1a MOISTURE TENSIONS				
1:1		1:10	6A1a ORGANIC CARBON	6B1a NITROGEN	C/N	EST% SALT (BUREAU CUP)	CONDUC-TIVITY EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv-alent	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
			%	%			0A1a	%		%	%	%
7.4	7.9	8.1	0.74	0.075	10	<0.20	0.4	<1				9.5
7.5	7.9	7.9	0.72	0.075	10	<0.20	0.4	<1				10.4
7.6	8.2	8.4	0.59	0.067	9	<0.20	0.5	<1				11.0
8.2	8.8	9.1	0.32	0.039	8	<0.20	0.4	12				8.3
8.3	9.0	9.2	0.22			<0.20	0.5	9				7.5
8.5	9.1	9.3	0.22			<0.20	0.6	20				6.5
8.7	9.2	9.4	0.24			<0.20	0.7	24				6.1
5A1a CATION EXCHANGE CAPACITY NH ₄ Ac		6N2b 6O2b 6H1a 6P2a 6Q2a EXTRACTABLE CATIONS 5B1a					5D2 EXCH. Na %	SAT. EXT. SOL. 8A1		4B4 Field State Water %	4A1a Bulk Den-sity g/cc	8A MOISTURE AT SATU-RATION %
		Ca	Mg	H	Na	K		6P1a Na	6Q1a K			
		milliequivalents per 100g. soil						me/liter				
18.0	13.0	5.1	1.6	<0.1	1.0	<1		0.2	0.3			44.8
18.9	14.1	5.5	1.2	<0.1	0.8	<1		0.2	0.2	8.7	1.64	48.2
21.6	19.9	7.0	0.4	0.1	0.5	<1		0.3	0.1	11.3	1.56	53.7
14.4		9.2	<0.1	0.1	0.3	1		0.5	0.1			48.0
13.5		7.8	<0.1	0.1	0.3	1		0.8	0.1			47.1
7.9		6.3	<0.1	0.2	0.2	2		1.2	0.1			37.4
5.6		6.0	<0.1	0.2	0.1	2		2.2	0.1			34.6

a. Few CaCO₃ concr.

Soil type: Ft. Collins sandy clay loam

Soil No.: 858Wyo-16-6

Location: Platte County, Wyoming; northeast quarter of southwest quarter of northwest quarter of Section 19, T24N, R67W; beginning at center of wooden culvert on No. 1 canal (which is approximately 600 feet east of west quarter corner of section) then east 557 feet and north 711 feet.

Physiographic position: High terrace.

Topography: Nearly level; 1 percent slope, southeast aspect.

Drainage: Well drained.

Vegetation: Cultivated.

Use: Dry cropland; 1958 winter wheat.

Collected by: James Allen, Keith Young, A. J. Cline, R. C. Kronenberger, and Fraser Stephens, October 8, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and

Lincoln

Lab. Number

- Ap1
9283 0 to 7 inches. Grayish brown or brown (10YR 5/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) sandy clay loam; hard when dry, very friable when moist; weak medium subangular blocky structure breaking to moderate fine granules; noncalcareous; horizon temperature 16.5 degrees centigrade; lower boundary clear and smooth.
- Ap2
9284 7 to 11 inches. Grayish brown or brown (10YR 5/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) sandy clay loam; very hard when dry, firm when moist; very weak coarse prismatic structure breaking to moderate medium and coarse subangular blocks; noncalcareous; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; horizon temperature 17.5 degrees centigrade; lower boundary abrupt and smooth.
- B2t
9285 11 to 16 inches. Grayish brown or brown (10YR 5/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) clay loam; very hard when dry, firm when moist; moderate medium and fine prismatic structure breaking to moderate to strong fine subangular blocks; noncalcareous; there are thin continuous clay skins on the surfaces of the soil aggregates; horizon temperature 17 degrees centigrade; lower boundary clear and wavy.
- B3ca
9286 16 to 28 inches. Light yellowish brown or pale yellow (2.5Y 6.5/3 dry) to light olive brown (2.5Y 5/3 moist) loam; hard when dry, very friable when moist; very weak coarse prismatic structure breaking to moderate medium subangular blocks; violently calcareous; this is a moderate horizon of lime accumulation with visible lime occurring as concretions and in thin seams and streaks; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; insect casts approximately 1/2-inch in diameter are common in this horizon; horizon temperature 17 degrees centigrade; lower boundary gradual and wavy.
- Cca1
9287 28 to 33 inches. Light yellowish brown or pale yellow (2.5Y 6.5/3 dry) to light olive brown (2.5Y 5/3 moist) loam; hard, dry; very friable, moist; massive or very weak coarse subangular; violently calcareous; moderate horizon of lime accumulation with visible lime occurring as concretions and in finely divided forms; horizon temperature 16.5 degrees centigrade; lower boundary clear and wavy.
- Cca2
9288 33 to 38 inches. Mixed colors ranging from light yellowish brown (2.5Y 6/3 dry) to pale yellow (2.5Y 8/3 dry) and olive brown (2.5Y 4/3 moist) and pale yellow (2.5Y 7/3 moist) gravelly sandy loam; hard when dry, very friable when moist; massive; violently calcareous; this is a weak horizon of lime accumulation with visible lime occurring mainly as concretions; approximately 20 percent of this horizon is gravel and cobble; horizon temperature 16.5 degrees centigrade; lower boundary clear and wavy.
- Cca3
9289 38 to 44 inches. Pale yellow (2.5Y 8/3 dry) to 2.5Y 7/3 moist gravelly sandy loam; hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in finely divided forms; approximately 20 percent of this horizon is gravel and cobble; lower boundary clear and wavy.
- D 44 inches plus. (Not sampled.) Loose single grained calcareous gravelly sand; horizon contains approximately 40 percent gravel and cobble; lime accumulation occurs mainly as a coating on the surface of the rock and cobble.

Note: Air temperature at time of sampling 18 degrees centigrade.

SOIL SURVEY LABORATORY

Lincoln, Nebr.

August 1959

SOIL TYPE

Ft. Collins
sandy clay loam

LOCATION

Platte County, Wyoming

SOIL NOS.

S58Wyo-16-7

LAB. NOS.

9290-9295

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	0.02-0.006		> 2 (19mm)
0-6	Ap	1.8	4.6	7.2	21.0	24.6	18.8	22.0	50.9	7.0	4	scl
6-9 1/2	B2t	0.7	2.3	4.8	17.5	24.8	24.0	25.9	52.9	8.5	Tr.	scl
9 1/2-17	B3ca	0.3a	1.7a	3.9a	20.9a	26.8a	25.2	21.2	57.6	9.1	Tr.	scl
17-30	Cca	1.0a	3.2a	5.4a	23.5a	27.6a	21.8	17.5	57.4	7.8	Tr.	vscl
30-50	Cl	3.2a	7.2a	8.8a	29.7a	25.3a	13.6	12.2	53.5	4.3	7	fscl
50-60+	D	9.4b	11.1b	9.2b	23.8b	15.0b	11.5	20.0	34.6	5.6	19	scl/fscl
pH		ORGANIC MATTER				EA2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM @ 25°C	E1a		MOISTURE TENSIONS		
1:1		8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)		CaCO ₃ equivalent	GYPSUM mg./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
8.2		1:10	ORGANIC CARBON %	NITROGEN %	C/N							
7.9	8.2	8.3	1.19	0.112	10.6	< 0.20	0.7	< 1				9.0
7.9	8.3	8.5	0.80	0.089	9	< 0.20	0.6	< 1				10.9
8.1	8.6	9.0	0.56	0.058	10	< 0.20	0.6	10				7.9
8.2	8.8	9.0	0.28	0.032	9	< 0.20	0.8	9				6.3
8.3	9.0	9.1	0.10			< 0.20	0.7	5				4.2
8.3	9.0	9.2	0.10			< 0.20	0.9	22				5.7
5A1a	EXTRACTABLE CATIONS					5D	SAT. EXT. SOL.		8A1	4B4	4A1a	8A
CATION EXCHANGE CAPACITY MEQ/AC	6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %	6P1a	6Q1a		Field State Water	Bulk Density	MOISTURE AT SATURATION %
	Ca	Mg	H	Na	K		Na	K		%	g/cc	
	milliequivalents per 100g. soil						me/liter					
18.9	19.0	4.3	0.4	0.2	1.1	1	1.1	0.5				48.6
20.8	22.5	5.4	< 0.1	0.3	0.7	1	1.2	0.2		9.6	1.56	53.1
13.2		3.8	< 0.1	0.3	0.2	2	1.6	0.1				44.3
11.6		3.4	< 0.1	0.3	0.2	2	2.2	0.1				40.2
8.4		2.8	< 0.1	0.2	0.2	2	1.8	0.1				31.2
6.3		3.4	< 0.1	0.2	0.1	2	2.1	0.1				29.9

a. Trace CaCO₃ concr.
b. Common CaCO₃ concr.

Soil type: Ft. Collins sandy clay loam

Soil No.: S58Wyo-16-7

Location: Platte County, Wyoming; northwest quarter of southwest quarter of southwest quarter of Section 16, T23N, R68W; beginning at southwest corner (center of crossroads), then north 1094 feet and east 550 feet.

Physiographic position: High terrace.

Topography: Gently sloping; 2 percent slope, southeast aspect.

Drainage: Well drained.

Vegetation: Cultivated.

Use: Irrigated cropland; 1958 oats.

Collected by: James Allen, Keith Young, A. J. Cline, R. C. Kronenberger, and Fraser Stephens, October 8, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and

Lincoln

Lab. Number

- Ap
9290 0 to 6 inches. Brown or pale brown (10YR 5.5/3 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) sandy clay loam; very hard when dry, very friable when moist; weak coarse subangular blocky structure breaking to moderate very fine granules; noncalcareous; horizon temperature 18.5 degrees centigrade; there are thin patchy clay skins on both the horizontal and vertical faces of most of the soil aggregates; lower boundary abrupt and smooth.
- B2t
9291 6 to 9½ inches. Brown (10YR 5/3 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) sandy clay loam; very hard when dry, firm when moist; moderate medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; horizon temperature 16.5 degrees centigrade; lower boundary clear and wavy.
- B3ca
9292 9½ to 17 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) sandy clay loam; hard when dry, friable when moist; moderate medium subangular blocky structure; this is a moderate to strong horizon of lime accumulation with visible lime occurring as concretions and in finely divided forms; there are a few thin patchy clay skins principally on the vertical faces of the soil aggregates; horizon temperature 16 degrees centigrade; lower boundary gradual and smooth.
- Cca
9293 17 to 30 inches. Light yellowish brown (2.5Y 6/3 dry) to olive brown or light olive brown (2.5Y 4.5/3 moist) heavy sandy loam; hard when dry, very friable when moist; massive or very weak medium subangular blocky structure; violently calcareous; this is a weak to moderate horizon of lime accumulation with visible lime occurring as concretions and in thin seams and streaks; horizon temperature 16 degrees centigrade; lower boundary gradual and smooth.
- C1
9294 30 to 50 inches. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/3 moist) sandy loam; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a weak horizon of lime accumulation with visible lime occurring mostly as concretions; horizon temperature 16.5 degrees centigrade; lower boundary gradual and wavy.
- D
9295 50 to 60 inches plus. Pale yellow (2.5Y 7/3 dry) to light yellowish brown (2.5Y 6/3 moist) gravelly or cobbly loamy sand; loose when dry or moist; single grained; this horizon contains a few large soft concretions of lime several inches in diameter and intermixed with less limy material; approximately 70 percent of this horizon is gravel and cobble.

Note: Air temperature at the time of sampling 17.5 degrees centigrade.

SOIL TYPE Ft. Collins LOCATION Platte County, Wyoming
 very fine sandy loam

SOIL NOS. 858Wyo-16-10 LAB. NOS. 9306-9312

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)	
0-3 1/2	Ap	1.4	3.3	3.7	15.9	47.9	14.2	13.6	71.4	3.7	8	vfs1
3 1/2-8	B21t	1.4	1.9	2.2	10.4	39.0	19.9	25.2	62.3	5.3	3	scl
8-12	B22t	0.8a	1.0a	1.1a	8.3a	35.5a	30.1	23.2	61.9	10.6	Tr.	1
12-16	B2ca	0.6a	1.3a	1.6a	9.6a	34.8a	29.0	23.1	60.7	10.9	Tr.	1
16-21	B3ca	1.8a	2.3a	2.6a	11.0a	29.3a	26.4	26.6	52.8	11.2	4	scl
21-29	Cca1	3.2b	3.7b	3.5b	8.6b	14.7b	20.6	45.7	28.8	12.0	6	c
29-38	Cca2	2.8b	4.4b	4.5b	11.1b	18.2b	23.5	35.5	36.5	12.1	7	cl

pH	ORGANIC MATTER					8A2 EST% SALT (BUREAU CUP)	ELECTRI- CAL CONDUCTI- VITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a CaCO ₃ equiv- alent %	MOISTURE TENSIONS		
	8C1a		6A1a	6B1a	C/N				4B2 15 ATMOS.		
	1:5	1:10	ORGANIC CARBON %	NITRO- GEN %						1/10 ATMOS.	1/3 ATMOS.
7.5	7.8	7.8	0.83	0.080	10	<0.20	0.5	<1			6.0
7.3	7.7	7.9	0.75	0.091	8	<0.20	0.5	<1			11.2
8.0	8.6	8.8	0.56	0.070	8	<0.20	0.5	8			11.0
8.1	8.7	8.9	0.42	0.056	8	<0.20	0.5	9			10.4
8.1	8.8	9.0	0.38	0.046	8	<0.20	0.5	15			10.2
8.4	9.0	9.2	0.27	0.031	9	<0.20	0.6	43			12.5
8.7	9.2	9.4	0.17			<0.20	0.8	29			11.1

5A1a CATION EXCHANGE CAPACITY NH ₄ Ac	EXTRACTABLE CATIONS 5B1a					5D2 EXCH. No %	8A1 SATURATION EXTRACT SOL.		8A MOISTURE AT SATU- RATION %
	6N2b	6O2b	6H1a	6P2a	6Q2a		6P1a	6Q1a	
	Ca	Mg	H	No	K		No	K	
12.7	9.9	2.3	0.4	<0.1	1.4	<1	0.2	1.0	39.0
22.2	18.0	4.9	<0.1	<0.1	1.3	<1	0.2	0.4	51.3
17.7		5.4	<0.1	<0.1	0.7	<1	0.3	0.3	51.1
16.9		6.6	<0.1	0.1	0.5	<1	0.3	0.3	49.2
15.2		7.3	<0.1	0.1	0.8	1	0.5	0.4	46.5
9.5		7.2	<0.1	0.4	0.5	3	2.0	0.4	50.8
11.2		8.7	<0.1	0.9	0.7	6	3.4	0.3	48.7

← milliequivalents per 100g. soil → ← milliequivalents per liter →

a. Trace CaCO₃ condr.
 b. Few CaCO₃ condr.

Soil type: Ft. Collins very fine sandy loam

Soil No.: S58Wyo-16-10

Location: Platte County, Wyoming; northeast quarter of southeast quarter of southwest quarter of Section 14, T26N, R63W; starting at north end of metal culvert (approximately 300 feet north of south "Y" of Dwyer Junction on east side of U. S. Highway 87), then west 52 feet to west side of pavement, northwest along edge of highway 974 feet, southwest at right angle to U. S. Highway 87 for 235 feet.

Physiographic position: High terrace.

Topography: Nearly level to very gently undulating; 0 to 1 percent slopes.

Drainage: Well drained.

Vegetation: Cultivated.

Use: Dry cropland; 1958 winter wheat.

Collected by: James Allen, Keith Young, A. J. Cline, R. C. Kronenberger, Harold Bindschadler, Norman Stinnette, Pat Shields, and Fraser Stephens, October 9, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and

Lincoln

Lab. Number

Ap 9306	0 to 3½ inches. Light gray or light grayish brown (10YR 6/1.5 dry) to dark gray or dark grayish brown (10YR 4/1.5 moist) very fine sandy loam; soft when dry, very friable when moist; weak medium subangular blocky structure breaking to moderate very fine granules; noncalcareous; lower boundary clear and smooth.
B2lt 9307	3½ to 8 inches. Grayish brown or light brownish gray (10YR 5.5/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy clay loam; very hard when dry, friable when moist; moderate medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; lower boundary clear and smooth.
B22t 9308	8 to 12 inches. Pale brown or light yellowish brown (1.25Y 6/3 dry) to brown or light olive brown (1.25Y 5/3 moist) light clay loam; hard when dry, very friable when moist; weak medium prismatic structure breaking to moderate fine subangular blocks; strongly calcareous; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; lower boundary gradual and smooth.
B2ca 9309	12 to 16 inches. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/3 moist) light clay loam; hard when dry, very friable when moist; moderate medium fine subangular blocks; violently calcareous; this is a very weak horizon of lime accumulation with visible lime occurring mainly as an occasional concretion; insect casts approximately 1/2-inch in diameter are common in this horizon; there are very few thin patchy clay skins on the soil aggregates; lower boundary gradual and smooth.
B3ca 9310	16 to 21 inches. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/3 moist) light clay loam or sandy clay loam; hard when dry, very friable when moist; weak medium subangular blocky structure; violently calcareous; this is a weak to moderate lime accumulation with many calcium carbonate concretions; lower boundary gradual and smooth.
Cca1 9311	21 to 29 inches. White (2.5Y 8/2 dry) to pale yellow (2.5Y 7/3 moist) sandy clay loam; hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime occurring in divided forms; lower boundary gradual and wavy.
Cca2 9312	29 to 38 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) sandy clay loam; hard when dry, very friable when moist; massive; violently calcareous; this is a moderate to strong lime horizon with visible lime occurring in finely divided forms and as concretions.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Glenberg **LOCATION** Goshen County, Wyoming
 very fine sandy loam

SOIL NOS. 952Wyo-8-2 **LAB. NOS.** 1238-1247

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1					2A2		> 2 (< 19mm)	
		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	0.2-0.02	0.02-0.002				
0-3 1/2	A1p	1.8	4.0	3.5	21.5	36.8	21.0	11.4	68.8	5.0	1	vfsl
3 1/2-10 1/2	A12	2.3	3.9	3.8	21.3	37.3	20.6	10.8	68.5	5.1	1	vfsl
10 1/2-13	A13	2.5	5.0	4.9	24.4	31.4	22.4	9.4	65.4	5.1	1	vfsl
13-21	A14	3.2	6.2	6.0	23.8	27.4	24.1	9.3	60.1	6.9	1	vfsl
21-30	A1b	2.9	5.8	5.6	22.7	27.8	25.1	10.1	60.5	7.1	1	vfsl
30-38	B2b	3.8	5.2	5.4	22.7	24.8	25.8	12.3	58.1	7.4	1	vfsl
38-42	Cca-b	1.2	3.0	4.1	20.1	20.4	31.0	20.2	54.1	10.7	Tr.	1
42-49	Cu-1	1.3	3.6	5.3	29.2	26.3	21.5	12.8	60.4	7.0	Tr.	vfsl
49-61	Cu-2	2.1	5.1	5.7	30.5	28.9	20.2	7.5	63.4	6.2	1	fsl
61+	Cu-3	1.5	3.8	5.0	29.6	26.4	22.1	11.6	59.4	9.5	1	vfsl
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM 8A1a	CaCO ₃ equivalent %	GYPSUM mg./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
7.6	8.4	8.6	0.66			-	1.3	-	-			6.2
7.4	8.3	8.4	0.64			-	0.7	-	-			6.4
7.4	8.5	8.6	0.35			-	0.7	-	-			5.6
7.5	8.7	8.8	0.34			-	1.0	-	-			5.6
7.7	9.0	9.2	0.30			-	0.7	-	-			5.9
7.6	9.2	9.4	0.26			-	0.8	4	-			7.5
7.6	9.2	9.4	0.31			-	0.8	13	-			10.6
7.7	9.3	9.4	0.20			-	0.8	6	-			6.9
7.6	9.2	9.4	0.13			-	0.8	2	-			5.1
7.6	9.0	8.8	0.10			-	1.0	2	-			7.1
5A1a	5B1a	CATIONS			5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE			EXCH. Na %	6P1a	6Q1a			MOISTURE AT SATURATION %	
	6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K		Na	K				
	milliequivalents per 100g. soil						milliequivalents per liter					
12.3	9.6	2.8		0.4	1.1	3	5.0	0.9			34.5	
12.0	8.6	2.7		0.3	1.1	2	2.2	0.8			33.7	
10.8	7.7	2.5		0.3	0.7	3	3.7	0.4			28.0	
11.0	8.3	2.5		0.4	0.5	4	4.8	2.8			26.8	
11.2		2.4		0.4	0.6	4	4.3	0.2			27.2	
11.4				0.4	0.6	4	4.3	0.2			28.8	
13.7				0.6	0.6	4	3.7	0.2			37.5	
10.6				0.4	0.5	4	3.7	0.2			29.4	
9.5				0.4	0.4	4	3.7	0.2			27.8	
13.8				0.4	0.5	3	3.7	0.2			31.4	

Soil type: Glenberg very fine sandy loam

Soil No.: S52Wyo-8-2

Location: Goshen County, Wyoming; northeast corner of southwest quarter of northeast quarter of southeast quarter of Section 5, T25N, R61W; photo 12-49.

Vegetation: Cultivated.

Slope: Nearly level bench about 8 feet above flood plain of North Platte River.

Described by: C. J. Fox, October 1952.

Horizon and

Mandan

Lab. Number

Alp 1238	0 to 3½ inches. Brown (10YR 5/3 dry) to dark brown (10YR 4/3 moist) weak crumb-structured friable very fine sandy loam; noncalcareous; clear boundary.
A12 1239	3½ to 10½ inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) weak crumb-structured fine sandy loam; noncalcareous; friable; gradual boundary.
A13 1240	10½ to 13 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) friable fine sandy loam with weak fine crumb structure and containing an occasional quartz pebble; noncalcareous; gradual boundary.
A14 1241	13 to 21 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) fine crumb-structured fine sandy loam containing an occasional quartz gravel; friable; slightly calcareous; clear boundary.
Alb 1242	21 to 30 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) friable weak fine granular fine sandy loam; occasional worm casts; moderately calcareous; clear boundary.
B2b 1243	30 to 38 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) weak fine granular loam; very strongly calcareous; boundary between this layer and following layer is wavy.
Cca-b 1244	38 to 42 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) weak fine granular silt loam with distinct common mottlings of grayish brown (10YR 5/2 moist); friable; strongly calcareous; abrupt boundary.
Cu-1 1245	42 to 49 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) weak fine granular fine sandy loam; strongly calcareous; friable; clear boundary.
Cu-2 1246	49 to 61 inches. Light yellowish brown (10YR 6/4 dry) to yellowish brown (10YR 5/4 moist) loamy fine sand with single grain and weak fine granular structure; strongly calcareous; nearly loose; gradual boundary.
Cu-3 1247	61 inches plus. Light yellowish brown (10YR 6/4 dry) to yellowish brown (10YR 5/4 moist) weak fine granular fine sandy loam stratified with layers of grayish brown (10YR 5/2 moist) silty clay; silty clay layers have occasional reddish brown fine mottlings; strongly calcareous.

SOIL SURVEY LABORATORY

Mandan, North Dakota

9/19/55

SOIL TYPE *Griffy

LOCATION

Fremont County, Wyoming

sandy clay loam

SOIL NOS. S54 Wyo-7-3

LAB. NOS. 2506-2512

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		8A1											
		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	2A2 > 2 (9mm)		
0-2	A1	0.5	4.2	8.4	15.1	22.1	35.5	14.2	52.6	13.0	-	1	
2-5	B21t	0.7	5.9	11.9	17.2	14.6	25.0	24.7	36.9	11.0	1	scl	
5-10	B22t	0.8	5.4	12.8	21.4	15.1	23.1	21.4	38.9	10.2	-	scl	
10-17	B3ca	0.5	7.1	15.5	26.0	13.9	18.4	18.6	37.1	8.2	-	fsl	
17-24	C1ca	1.0	8.8	19.8	32.5	12.8	10.9	14.2	34.9	5.3	Tr.	fsl	
24-30	C2ca	1.9	10.1	21.4	32.9	10.6	8.9	14.2	30.0	5.3	1	fsl	
30-37	C3ca	1.4	11.4	20.6	29.4	10.4	9.6	17.2	28.2	5.8	1	sl	
		pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a		MOISTURE TENSIONS		
8C1b	8C1a	8C1a	6A1a	6B1a		ESTR. SALT (BUREAU CUP)	EC x 10 ³	CaCO ₃ equiv- alent	GYP SUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
SATURATED PASTE	1:5	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N		PER CM	%		%	%	%	
7.5	7.9	7.7	0.62	.061	10.2	-	0.7	-				6.0	
7.2	7.3	7.1	0.57	.060	9.5	-	0.5	-				9.3	
7.4	8.1	8.2	0.42	.045	9.3	-	0.7	-				8.6	
7.9	8.6	8.6	0.36	.038	9.5	-	0.6	3				7.8	
8.0	8.9	8.8	0.28			-	0.7	4				5.9	
8.2	9.3	9.3	0.22			-	0.8	5				5.6	
8.2	9.3	9.3	0.16			-	1.0	10				6.2	
5A1a		EXTRACTABLE CATIONS				5D2	SATURATION EXTRACT SOLUBLE				6A		
CATION EXCHANGE CAPACITY (NH ₄ Ac)	6M2b	6O2b	6P2a		6Q2a	EXCH. No %	6P1a	6Q1a			MOISTURE AT SATURATION %		
	Ca	Mg	N	Na	K		Na	K	milliequivalents per liter				
← milliequivalents per 100g. soil →													
14.3	10.8	3.9		0.2	0.8	1	0.4	0.2			32.2		
23.8	17.4	6.5		0.3	0.3	1	0.4	-			41.0		
21.2				0.2	0.2	1	0.7	-			38.8		
16.3				0.4	0.2	2	1.4	-			38.8		
12.3				0.6	0.1	4	2.6	-			32.1		
11.3				0.9	0.2	6	4.9	-			34.2		
10.8				1.2	0.2	9	6.9	-			32.6		

Soil type: *Griffy sandy clay loam

Soil No.: 854Wyo-7-3

Location: Fremont County, Wyoming; approximately 0.4 mile northeast of junction of U.S. 26 and Paradise Valley Road, near southeast corner northeast quarter of Section 12, T1N, R3E.

Physiographic position: An old Pleistocene high terrace.

Topography: Nearly level to very gently undulating with slopes of 1/2 to 1 percent.

Vegetation: Approximately 60 percent cover of sagebrush, short grasses, predominantly blue grama, western wheatgrass and needlegrass, cactus and sedges.

Drainage: Well drained.

Use: Pasture.

Collected by: L. T. Alexander, James Allen, Harold Bindschadler, Clarence Faulks, and A. J. Cline, August 19, 1954.

Described by: A. J. Cline.

Horizon and

Lincoln

Lab. Number

- A1
2506 0 to 2 inches. Light gray (10YR 7/2 dry) to dark grayish brown (10YR 4/2 moist) loam; soft when dry, very friable when moist; weak coarse platy breaking to moderate very fine granular; the upper 1/16- or 1/8-inch is nearly a white when dry and forms a vesicular crust that is very fragile and easily broken; noncalcareous; lower boundary abrupt and smooth; there are a few small pebbles scattered on the surface of this location.
- B2lt
2507 2 to 5 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2.5 moist) light sandy clay loam; slightly hard when dry, very friable when moist; weak coarse columnar breaking to moderate coarse platy; platy structure is easily seen in this horizon but the coarse columns with slightly rounded tops are the primary structure; noncalcareous; there are a few very weak and very thin patchy clay skins visible under the hand lens; the horizon contains some fine gravel.
- B22t
2508 5 to 10 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2.5 moist) light sandy clay loam; very hard when dry, very firm when moist; moderate coarse columnar breaking to moderate coarse angular blocky; the tops of the aggregates in this horizon are slightly rounded. This structure most easily seen when the horizon above has been brushed away; a few weak clay skins; noncalcareous; lower boundary abrupt and smooth.
- B3ca
2509 10 to 17 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) heavy fine sandy loam; very hard when dry, very firm when moist; weak coarse angular blocky structure; calcareous; the horizon contains some small calcium carbonate concretions; lower boundary gradual and smooth; contains a few small gravels.
- C1ca
2510 17 to 24 inches. Light gray (2.5Y 7/2 dry) to light olive brown (2.5Y 5/3 moist) fine sandy loam; very hard when dry, very firm when moist; massive to very weak very coarse subangular blocky structure; calcareous; the horizon contains much accumulated lime principally as lime flour; lower boundary gradual and smooth; horizon contains a few small gravel fragments.
- C2ca
2511 24 to 30 inches. Pale yellow (2.5Y 7/3 dry) to light olive brown (2.5Y 5/3 moist) fine sandy loam; very hard when dry, firm when moist; massive; calcareous; the horizon contains much accumulated lime principally as lime flour; lower boundary clear and smooth; the horizon contains moderate amounts of gravel.
- IIC3ca
2512 30 to 37 inches. White (2.5Y 8/2 dry) to light yellowish brown (2.5Y 6/3 moist) gravelly and cobbly fine sandy loam; hard to slightly hard when dry; friable to loose when moist; massive to single grain; calcareous; the horizon contains moderate amounts of accumulated lime chiefly as lime flour.

SOIL SURVEY LABORATORY Mandan, North Dakota 9/19/55

SOIL TYPE *Griffy loam LOCATION Fremont County, Wyoming

SOIL NOS. S54Wyo-7-4 LAB. NOS. 2513-2519

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURE CLASS
		1B1a		3A1						2A2		
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	> 2	($< 19\mu$)		
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				
0-2	A1	1.8	6.3	8.5	15.3	26.6	29.7	11.8	54.0	10.8	1	vfs1
2-5	B2lt	1.0	5.7	7.7	13.6	20.9	32.2	18.9	45.7	14.8	Tr.	1
5-10	B2tca	0.9	5.7	9.0	16.7	20.9	24.6	22.2	44.9	9.5	Tr.	scl
10 1/2-18	B2tca	1.5	7.4	11.9	21.5	16.7	21.6	19.4	41.1	8.2	1	fsl
18-25	B3ca	2.3	10.9	17.1	27.5	12.4	15.1	14.7	34.8	6.1	Tr.	sl
25-36	C1ca	2.9	12.6	18.5	34.3	10.6	8.4	12.7	31.8	4.7	Tr.	fsl
36+	IIC2ca	4.0	15.6	19.6	34.4	9.6	6.4	10.4	29.6	3.9	-	ls
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	MOISTURE TENSIONS			
8C1b SATURATED PASTE	8C1a	8C1a	6A1a	6B1a	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMOS PER CM @ 25°C	CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITROGEN %				%		%	%	%
7.0	7.3	7.3	0.87	.082	10.6	-	0.7	1				5.5
7.3	7.7	7.8	0.64	.066	9.7	-	0.6	1				7.6
7.8	8.6	8.6	0.61	.061	10.0	-	0.6	4				8.5
8.1	9.3	9.4	0.35	.036	9.7	-	0.8	5				7.9
8.2	9.6	9.8	0.17	.021		-	1.1	3				6.4
8.3	9.8	9.8	0.14			-	2.0	5				5.1
8.1	9.5	9.6	0.11			-	3.2	3				3.9
5A1a	EXTRACTABLE CATIONS					5D2	SATURATION EXTRACT SOLUBLE			8A		
CATION EXCHANGE CAPACITY (NH ₄ Ac)	6N2b	6O2b	6P2a		6Q2a	EXCH. No %	6P1a	6Q1a		MOISTURE AT SATURATION %		
	Ca	Mg	H	Na	K		Na	K				
	← milliequivalents per 100g. soil →						← milliequivalents per liter →					
14.7	8.9	3.8		0.2	0.9	1	0.4	0.4		34.5		
17.7	12.9	5.0		0.3	1.0	2	0.6	0.2		37.1		
16.3				0.5	0.6	3	1.2	0.1		39.4		
14.6				1.6	0.2	10	6.1	-		34.0		
12.8				2.8	0.2	20	8.9	-		30.6		
10.2				3.1	0.1	25	17.6	-		29.4		
9.3				2.9	0.1	22	28.0	-		28.9		

Soil type: *Griffy loam

Soil No.: S54Wyo-7-4

Location: Fremont County, Wyoming; 0.1 mile southeast, 0.2 mile west of bend in the Burma Road near the center of Section 28, T2N, R4E.

Physiographic position: An old high terrace level well above the present flood plains and terraces.

Topography: Nearly level to very gently undulating slopes of 0 to 1 percent.

Drainage: Well drained.

Vegetation: Approximately 50 to 60 percent cover of sagebrush and some scattered short grasses, sage and needlegrass.

Use: Pasture.

Collected by: L. T. Alexander, James Allen, Harold Rindschadler, Clarence Faulks, and A. J. Cline, August 18, 1954.
Described by: A. J. Cline.

Horizon and

Lincoln

Lab. Number

- A1
2513 0 to 2 inches. Light gray (10YR 7/2 dry) to grayish brown (10YR 5/2 moist) fine sandy loam; soft when dry, very friable when moist; weak medium platy breaking to moderate very fine granular; the upper 1/8- to 1/16-inch forms a very fragile thin crust; noncalcareous; lower boundary abrupt and smooth.
- B21t
2514 2 to 5 inches. Pale brown (10YR 6/3 dry) to brown (10YR 4/2.5 moist) loam; slightly hard when dry, very friable when moist; weak coarse columnar breaking to moderate medium platy; secondary platy structure is pronounced in this horizon although the initial form is that of a column with a slightly rounded cap; noncalcareous; lower boundary abrupt and wavy.
- B22tca
2515 5 to 10½ inches. Pale brown (10YR 6/3 dry) to brown (10YR 4/2.5 moist) heavy loam or light clay loam; very hard when dry, firm when moist; moderate coarse columnar breaking to moderate coarse angular blocky or in some instances a very coarse plate an inch or two inches on a side but with their vertical axis shorter than their horizontal; calcareous; the horizon contains moderate amounts of calcium carbonate concretions; a few very thin clay skins; lower boundary abrupt and smooth.
- B23tca
2516 10½ to 18 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) sandy clay loam; very hard when dry, firm when moist; weak to moderate coarse prismatic breaking to moderate coarse angular blocky; calcareous; horizon contains moderate amounts of accumulated lime partly as lime flour and partly as concretions; there are a few thin patchy clay skins; lower boundary gradual and smooth.
- B3ca
2517 18 to 25 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) sandy clay loam; very hard when dry, firm when moist; weak coarse subangular blocky structure; calcareous; much accumulated lime chiefly as lime flour; lower boundary gradational and smooth.
- C1ca
2518 25 to 36 inches. White (2.5Y 8/2 dry) to light olive brown (2.5Y 5/3 moist) light fine sandy loam; the horizon contains some fine gravel; slightly hard when dry, friable when moist; massive; calcareous; the horizon contains large amounts of accumulated lime chiefly as lime flour; lower boundary is gradational and smooth.
- IIC2ca
2519 36 inches plus. Light gray (2.5Y 7/2 dry) to light olive brown (2.5Y 5/3 moist) gravelly loamy fine sand; slightly hard when dry, very friable to loose when moist; massive to single grain; calcareous; much accumulated lime principally as lime flour; this is the underlying strata of coarse sand and gravel of alluvial origin.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Haverson **LOCATION** Goshen County, Wyoming
loam

SOIL NOS. S50Wyo-8-7 **LAB. NOS.** 547-553

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		3A1											
		1B1a	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		2A2 > 2 (< 9mm)
0-4	A1	6.5	9.5	5.9	13.1	29.0	23.9	12.1	55.0	5.9	6	fsl	
4-13	C1	6.2	10.0	5.4	11.2	27.6	26.2	13.4	54.2	6.7	4	fsl	
13-26	C2ca	2.9	5.0	4.2	11.3	28.4	25.8	22.4	53.8	8.1	1	scl	
26-31	C3ca	2.6	4.8	3.8	14.2	27.1	26.1	21.4	52.2	10.8	1	scl	
31-38	C4ca	1.0	4.6	5.0	19.7	31.8	22.2	15.7	60.0	7.9	-	vfs1	
38-52	C5ca	2.5	4.4	3.1	9.0	23.4	35.9	21.7	50.3	15.7	-	l	
52-66	C6ca	7.0	11.5	7.9	13.1	25.0	24.2	11.3	49.8	8.1	3	fsl	
		ORGANIC MATTER					8A2	ELECTRI- CAL CONDUCT- IVITY EC x 10 ³ MILLIMHOS PER CM 25°C	6E1a	6F1a	MOISTURE TENSIONS		
	pH	8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)	CoCO ₃ equiv- alent	GYP-SUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
	8C1b SATU- RATED PASTE	1:5	1:10	ORGANIC CARBON %	NITRO- GEN %	C/N		%	%	%	%	%	
7.9	8.7	8.9	0.88	.093	9.5	-	0.5	1	-			6.6	
7.9	8.7	8.8	0.74	.079	9.4	-	0.7	1	-			6.9	
8.0	8.8	9.1	0.29	.035	8.3	-	1.0	10	-			9.5	
8.1	8.8	9.2	0.19	.022		-	1.4	11	-			9.2	
8.1	9.1	9.3	0.10	.012		-	1.5	9	-			6.9	
8.4	9.5	9.7	0.11	.019		-	1.2	15	-			8.9	
8.3	9.7	9.7	0.08	.012		-	1.2	4	-			5.8	
	5A1a CATION EXCHANGE CAPACITY NH ₄ OAc	EXCHANGEABLE CATIONS					5B1b	5D2	SATURATION EXTRACT SOLUBLE			8A MOISTURE AT SATU- RATION	
		Ca	Mg	H	Na	K	EXCH. Na %	6P1a Na	6Q1a K			%	
		milliequivalents per 100g. soil						milliequivalents per liter					
12.4					0.4	1.8	3	4.4	-			29.6	
12.6					0.6	1.8	5	5.3	-			30.2	
13.1					1.0	2.2	8	5.5	-			36.2	
13.0					0.9	2.8	7	8.7	-			35.6	
10.3					0.7	2.7	7	12.2	-			32.6	
11.8					2.4	2.9	20	1.5	-			39.0	
9.3					1.7	2.1	18	1.2	-			25.2	

Soil type: Haverson loam

Soil No. 850Wyo-8-7

Location: Southwest quarter of southeast quarter of southeast quarter of Section 10, T24N, R61W, Goshen County, Wyo.

Vegetation: Irrigated and cultivated field on a nearly level low terrace; soil does not seem to be disturbed by levelling at this site.

Described by: W. M. Johnson.

Horizon and

Mandan

Lab. Number

- A1 0 to 4 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) soft, friable, weak coarse and medium granular loam containing a few 1/2-inch pebbles; moderately calcareous.
547
- C1 4 to 13 inches. Soft, friable, weak irregular blocky loam of the same color as the surface horizon; contains a little very coarse sand and a few small pebbles; strongly calcareous.
548
- C2ca 13 to 26 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) containing many faint, very pale brown mottles; slightly hard, friable, weak irregular blocky silt loam; very strongly calcareous; gradual boundary.
549
- C3ca 26 to 31 inches. Very pale brown (10YR 8/3 dry, 7/3 moist) with many fine faint light gray mottles, soft, friable, weak irregular blocky silt loam; very strongly calcareous; gradual boundary.
550
- C4ca 31 to 38 inches. Very pale brown (10YR 7/2.5 dry) to pale brown (10YR 6/3 moist) soft, friable, massive, gritty loam and silt loam; very strongly calcareous; gradual boundary.
551
- C5ca 38 to 52 inches. Light brownish gray (10YR 6/1.5 dry) to grayish brown (10YR 5/2 moist) with common distinct mottles of white, hard friable massive slightly gritty silt loam; very strongly calcareous; gradual boundary.
552
- C6ca 52 to 66 inches. Light brownish gray (10YR 6.5/2 dry) to dark grayish brown (10YR 4/2 moist) with very fine distinct white mottles, slightly hard, friable, massive loam; very strongly calcareous; abrupt boundary.
553

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Keith **LOCATION** Goshen County, Wyoming
 very fine sandy loam

SOIL NOS. S53Wyo-8-3 **LAB. NOS.** 1895-1900

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a		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	Ap	0.3	1.4	2.8	9.5	39.8	27.0	19.2	63.5	9.8	-	vfsl	
5-11	B1	0.2	0.6	1.3	6.0	37.8	34.3	19.8	63.9	12.6	-	1	
11-16	B21t	-	-	1.6	6.3	38.6	28.8	25.7	60.5	10.5	-	1	
16-26	B22t	-	0.3	0.8	4.1	36.8	34.5	23.5	60.3	14.1	-	1	
26-43	C1ca	-	-	0.4	1.4	25.2	49.6	23.4	54.3	21.5	-	1	
43-60	C2ca	-	0.3	1.1	5.1	37.2	41.0	15.3	67.4	14.4	-	1	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		4B2	
8C1b	8C1a	8C1a	6A1a	ORGANIC CARBON	NITROGEN	C/N	EST% SALT (BUREAU 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		%	%				8A1a	%		%	%	%
7.6	8.1	8.4	1.04				<0.20	0.9	1				12.9
7.5	8.0	8.3	1.12				<0.20	0.8	1				11.3
7.6	8.1	8.3	0.73				<0.20	0.8	-	-			12.5
7.7	8.3	8.6	0.56				<0.20	1.0	3	-			13.2
7.7	8.5	8.8	0.36				<0.20	1.1	17	-			14.1
7.8	8.7	8.9	0.09				<0.20	1.0	9	-			9.4
5A1a	5B1a	CATIONS				5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE	EXCHANGEABLE		EXCHANGEABLE			EXCH. No %	6P1a	6Q1a			MOISTURE AT SATURATION	
	Ca	6O2b Mg	H	6P2a Na	6Q2a K			Na	K			%	
	milliequivalents per 100g. soil							milliequivalents per liter					
20.9		3.0		0.3	2.3		1	1.7	1.2			39.0	
23.2		3.3		0.3	2.2		1	1.5	1.0			44.1	
24.5		3.4		0.3	1.9		1	1.7	0.6			49.8	
23.8		5.6		0.4	2.2		2	2.0	1.0			48.5	
21.1		8.2		0.4	2.8		2	1.5	1.6			48.5	
19.3		7.5		0.6	2.8		3	2.3	1.6			38.5	

Soil type: Keith very fine sandy loam

Soil No.: S53Wyo-8-3

Location: Goshen County, Wyoming; northwest corner of northwest quarter of northwest quarter of Section 36, T23N, R61W; 70 feet south of highway and 900 feet east of Huntley School; photo 14-32.

Vegetation: Cultivated; irrigated bean field.

Slope: 1 percent or less; nearly level upland; well drained.

Parent material: Peorian or younger loess.

Described by: C. J. Fox, September 24, 1953.

Horizon and

Mandan

Lab. Number

Ap 1895	0 to 5 inches. Grayish brown (10YR 5/2 dry) or very dark grayish brown (10YR 3/2 moist) noncalcareous friable single grained very fine sandy loam; many fine bean roots; abrupt smooth boundary.
B1 1896	5 to 11 inches. Grayish brown (10YR 5/2 dry) or very dark grayish brown (10YR 3/2 moist) noncalcareous friable crumb and single grained loam; some roots; clear smooth boundary.
B2t 1897	11 to 16 inches. Dark brown (10YR 4/3 dry) or very dark grayish brown (10YR 3/2 moist) weak medium prismatic angular blocky friable silt loam; very weakly calcareous; crushes to single grains and fine weak granules; clear wavy boundary.
B2bt 1898	16 to 26 inches. Brown (10YR 5/3 dry) or very dark grayish brown (10YR 3/2 moist) coarse weak prismatic friable heavy silt loam; breaks to medium moderately developed angular blocky units that crush to weak fine granules; larger structural units thinly coated with darker material; soil is noncalcareous except in spots where it is slightly calcareous; gradual wavy boundary.
C1ca 1899	26 to 43 inches. Very pale brown (10YR 7/3 dry) or light yellowish brown (10YR 6/4 moist) very strongly calcareous friable single grained loam; gradual wavy boundary.
C2ca 1900	43 to 60 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) very strongly calcareous very friable single grained very fine sandy loam.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Keota **LOCATION** Goshen County, Wyoming
silt loam

SOIL NOS. S50Wyo-8-1 **LAB. NOS.** 508-513

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		
0-3	A1	1.5	2.9	1.8	5.2	18.9	58.4	11.3	52.9	28.2	-	sil	
3-6 1/2	AC	1.4	3.7	2.2	6.4	20.4	56.1	9.8	53.2	27.5	-	sil	
6 1/2-9	C1ca	0.6	2.0	1.5	5.1	25.4	53.8	11.6	57.9	24.7	-	sil	
9-25	C2ca	2.6	4.0	2.2	5.1	22.5	51.2	12.4	51.7	25.5	-	sil	
25-37	C3ca	2.5	4.3	2.3	5.1	20.8	53.2	11.8	50.8	26.9	-	sil	
a		1.2	3.1	4.3	11.1	29.2	37.1	14.0	57.2	16.0	-	1	

pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	CaCO ₃ equiv-alent %	GYPSUM ma./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
7.9	8.4	8.7	1.66	.150	11.1	-	0.5	6	-	-	12.4
8.0	8.6	8.9	0.86	.084	10.2	-	0.4	10	-	-	13.0
8.1	8.6	8.9	0.90	.093	9.7	-	0.4	5	-	-	11.7
8.1	8.7	9.0	0.87	.088	9.9	-	0.4	9	-	-	13.1
8.6	9.3	9.5	0.74	.075	9.9	-	0.9	9	-	-	13.2
8.0	8.5	8.8	0.98	.104	9.4	-	0.6	2	-	-	10.9

5A1a	EXCHANGEABLE CATIONS					5B1b	5D2	SATURATION EXTRACT SOLUBLE		8A
CATION EXCHANGE CAPACITY NH ₄ OAc	Ca	Mg	H	Na	K	EXCH. No %	6P1a Na	6Q1a K		MOISTURE AT SATURATION %
	milliequivalents per 100g. soil						milliequivalents per liter			
25.6				0.4	2.2	2	0.9	1.3		53.1
24.3				0.5	2.2	2	1.0	2.2		50.6
24.5				0.6	2.4	2	-	2.6		46.2
25.3				1.0	2.6	4	0.8	4.2		49.9
25.5				3.9	2.7	16	9.4	1.8		48.7
22.4				0.6	2.1	2	2.2	1.2		40.7

a. Composite surface sample from NE1/4 SW1/4 NE1/4 Sec. 14, T24N, R62W.

Soil type: Keota silt loam

Soil No.: S50Wyo-8-1

Location: Northwest quarter of southeast quarter of northwest quarter of Section 14, T24N, R62W, Goshen County, Wyo.

Vegetation: Virgin; good cover of blue grama grass and threadleaf sedge, some needlegrass (*Stipa*), sagebrush and cactus.

Slope: About 3 percent slope toward the north.

Described by: W. M. Johnson.

Horizon and
Mandan

Lab. Number

A1 508	0 to 3 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) with numerous specks and small spots of light gray; soft, friable; very weak fine subangular blocky silt loam that breaks to weak fine granules; calcareous.
AC 509	3 to 6½ inches. Light brownish gray (10YR 6.5/2 dry) to grayish brown (10YR 5/2.5 moist) with numerous white spots; soft, friable; weak prismatic silt loam that breaks to weak irregular blocks that in turn crush to weak granules; calcareous; grass roots very numerous; white spots are due to small particles of weathered Brule siltstone.
C1ca 510	6½ to 9 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) with white to pale brown specks and small spots; friable; moderate prismatic silt loam that breaks to weak blocks and crushes to weak granules; calcareous; grass roots numerous.
C2ca 511	9 to 25 inches. Soft friable calcareous silt loam of the same color and structure as the horizon above; compact in place; contains numerous small fragments of Brule siltstone; grass roots moderately numerous.
C3ca 512	25 to 37 inches. Very weak granular, very soft, very friable; calcareous silt loam that is nearly loose in place; same speckled color as horizon above; contains numerous tiny fragments of Brule siltstone; few roots.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Keota loam **LOCATION** Goshen County, Wyoming

SOIL NOS. S53Wyo-8-1 **LAB. NOS.** 1884-1889

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				
0-2 1/2	Ap	2.0	2.9	2.4	7.9	28.8	40.7	15.3	57.3	17.4	Tr.	1
2 1/2-5 1/2	AC	1.8	2.7	2.2	6.6	27.3	43.2	16.2	56.1	18.7	-	1
5 1/2-11	C1	1.7	2.7	2.0	5.9	25.7	44.4	17.6	53.0	20.9	-	1
11-17	C2	2.1	2.7	1.9	6.1	26.9	43.3	17.0	53.4	20.8	-	1
17-22	C3	1.5	2.7	1.9	5.9	26.2	45.2	16.6	54.0	21.2	-	1
22-32	C4	1.9	3.0	2.1	5.4	23.5	47.2	16.9	51.9	22.4	-	1

SATURATED PASTE	pH		ORGANIC MATTER		8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC · 10 ³ MILLIMHOS PER CM @ 25°C	6E1a CaCO ₃ equivalent %	6F1a GYPSUM me./100g SOIL	MOISTURE TENSIONS		
	8C1b	8C1a	8C1a	6A1a					1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITROGEN %					C/N		
7.8	8.2	8.5	1.27		0.20	0.8	8				12.1
7.7	8.1	8.4	1.01		0.20	0.6	8				13.1
7.6	8.1	8.5	0.73		0.20	0.6	11	-			14.0
7.7	8.3	8.5	0.69		0.20	0.6	11	-			14.0
7.7	8.2	8.5	0.63		0.20	0.6	12	-			13.8
7.7	8.3	8.6	0.56		0.20	0.6	14	-			14.0

CATION EXCHANGE CAPACITY NH ₄ OAc	5A1a		5B1a		5B1b		5D2 EXCH. No %	6A1 SATURATION		EXTRACT SOLUBLE		8A MOISTURE AT SATURATION %
	EXTRACTABLE		CATIONS		EXCHANGEABLE			6P1a	6Q1a			
	Ca	6O2b Mg	H	6P2a Na	6Q2a K	Na		K				
23.4		2.5			3.0		0.3	1.2				44.4
24.0		2.6			2.2		0.3	0.6				45.6
24.2		2.8		0.2	1.7	1	0.3	0.4				48.5
24.7		3.4		0.2	1.8	1	0.3	0.4				47.2
24.3		3.9		0.2	2.0	1	0.6	0.4				47.1
24.5		5.1		0.5	2.0	2	1.7	0.4				48.3

Soil type: Keota loam
 Soil No.: S53Wyo-8-1
 Location: Goshen County, Wyoming; 370 feet south and 45 feet west of northeast corner of Section 8, T28N, R61W.
 Vegetation: Cultivated; wheat stubble.
 Slope: 3 percent colluvial slope; slightly convex, faces south; well drained.
 Parent material: Weathered Brule siltstone plus some loess and colluvium.
 Described by: C. J. Fox, September 24, 1953.

Horizon and
 Mandan
 Lab. Number

Ap
 1884 0 to 2½ inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) moderately calcareous loam; single grain and weak fine granular structure; hard when dry, friable when moist; many fine roots; abrupt smooth boundary.

AC
 1885 2½ to 5½ inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) moderately calcareous friable loam; medium weak angular blocky structural units crush to single grains and very fine weak granules; many fine roots; clear smooth boundary.

C1
 1886 5½ to 11 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) strongly calcareous, coarse weak prismatic silt loam that crushes to single grains and very fine weak granules; hard when dry, friable when moist; many fine roots; numerous tiny Brule fragments; clear wavy boundary.

C2
 1887 11 to 17 inches. Grayish brown (10YR 5/2.5 dry) or dark grayish brown (10YR 4/2 moist) very fine granular friable silt loam; strongly calcareous; some roots; clear wavy boundary.

C3
 1888 17 to 22 inches. Pale brown (10YR 6/3 dry) to brown (10YR 4/3 moist) very friable weak fine granular and single grained silt loam; strongly calcareous; occasional roots; gradual wavy boundary.

C4
 1889 22 to 32 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) very strongly calcareous massive friable silt loam; few roots; abrupt irregular boundary.

R 32 inches plus. (Not sampled) Calcareous fragmental Brule bedrock.

Note: Small (1/8- to 1/4-inch) calcareous Brule fragments and small quartz pebbles in profile and on surface.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Keota loam **LOCATION** Goshen County, Wyoming

SOIL NOS. S53Wyo-8-2 **LAB. NOS.** 1890-1894

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				
0-4 1/2	Ap	1.6	2.0	1.3	7.2	35.9	39.4	12.6	64.5	16.2	-	1	
4 1/2-9	C1	0.8	1.7	1.2	7.0	34.4	40.5	14.4	63.0	17.1	-	1	
9-15	C2	0.8	1.9	1.2	4.7	31.9	44.5	15.0	60.2	19.7	-	1	
15-23	C3	1.6	2.1	0.9	4.4	31.1	44.9	15.0	58.9	20.5	-	1	
23-32	C4	1.8	2.5	1.1	4.9	27.5	49.4	12.8	57.1	23.4	-	1	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS			
8C1b	8C1a	8C1a	6A1a	ORGANIC MATTER		EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv- alent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.	
	1:5	1:10	%	%	C/N			%		%	%	%	
7.8	8.3	8.5	1.12			<0.20	0.7	6				11.1	
7.7	8.2	8.5	0.90			<0.20	0.6	7				11.7	
7.8	8.1	8.4	0.69			<0.20	0.6	10	-			13.1	
7.8	8.1	8.5	0.66			<0.20	0.6	10	-			10.1	
7.8	8.2	8.5	0.60			<0.20	0.7	11	-			13.0	
5A1a	5B1a	CATIONS				5D2	SATURATION EXTRACT SOLUBLE				8A		
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE		EXCH. No %	6P1a	6Q1a			MOISTURE AT SATURATION %			
	Ca	6O2b Mg	H	6P2a No		6Q2a K	Na	K	milliequivalents per liter				
	milliequivalents per 100g. soil												
22.0		2.0		0.2	3.0	1	0.3	1.2				47.8	
21.3		1.6		0.1	1.8	-	0.3	0.6				45.9	
22.2		2.0		0.1	1.0	-	0.6	0.4				46.5	
22.3		2.8		0.1	1.0	-	0.6	0.2				48.6	
23.7		4.0		0.4	1.5	2	1.2	0.2				46.9	

Soil type: Keota loam

Soil No.: S53Wyo-8-2

Location: Goshen County, Wyoming; northeast corner of northwest quarter of northeast quarter of Section 20, T24N, R62W; 70 feet south of road; photo 9-50.

Vegetation: Cultivated; wheat stubble.

Slope: 3 percent colluvial slope; plane, faces southwest; well drained.

Parent material: Weathered Brule siltstone plus some loess and probably a little colluvium.

Described by: C. J. Fox, September 24, 1953.

Horizon and

Mandan

Lab. Number

- Ap
1890 0 to 4½ inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) moderately calcareous very fine weak granular and single grained loam; friable when moist, slightly hard when dry; many roots and some tiny Brule fragments; abrupt smooth boundary.
- C1
1891 4½ to 9 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) moderately calcareous coarse weak prismatic loam; crushes to single grains and fine weak granules; friable when moist, slightly hard when dry; some fine roots and Brule fragments; gradual smooth boundary.
- C2
1892 9 to 15 inches. Pale brown (10YR 6/3 dry) or dark grayish brown (4/2 moist) single grain and weak fine granular loam; strongly calcareous; friable when moist, slightly hard when dry; many fine root hairs and occasional tiny Brule chips; gradual smooth boundary.
- C3
1893 15 to 23 inches. Pale brown (10YR 6/3 dry) to brown (10YR 4/3 moist) massive friable strongly calcareous loam; occasional fine roots and tiny Brule fragments; gradual smooth boundary.
- C4
1894 23 to 32 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) strongly calcareous massive friable loam that crushes to single grains; a few fine roots and Brule fragments; abrupt irregular boundary.
- R
32 inches plus. (Not sampled) Calcareous fragmental Brule siltstone; white spots and films of calcium carbonate in cracks.

SOIL SURVEY LABORATORY

Mandan, N. Dak.

SOIL TYPE Kim

LOCATION Goshen County, Wyoming

clay loam, alkali phase

SOIL NOS. S50Wyo-8-5

LAB. NOS. 535-540

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)		
0-3	A1	4.1	3.4	2.6	5.8	11.7	37.6	34.8	30.8	22.3	Tr.	c1	
3-8	AC	1.6	1.5	1.7	6.5	15.4	39.1	34.2	32.9	26.1	1	c1	
8-14	C1ca	12.3	10.1	5.5	9.0	8.8	27.8	26.5	23.6	18.6	-	scl	
14-20	C2ca	0.3	1.0	1.2	3.4	9.7	44.4	40.0	26.4	29.9	-	sic1/sic	
20-60	C3ca	-	0.7	0.8	2.1	9.4	45.2	41.8	26.5	29.5	-	sic	
a		0.3	3.0	4.1	8.8	14.6	32.2	37.0	33.1	19.1	-	c1	

8C1b SATURATED PASTE	pH 8C1a	ORGANIC MATTER				8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a CoCO ₃ equivalent %	6F1a GYPSUM me./100g SOIL	MOISTURE TENSIONS		
		8C1a	6A1a	6B1a	4F2 15 ATMOS. %							
		1:5	1:10	ORGANIC CARBON %						NITROGEN %	C/N	1/10 ATMOS. %
7.8	9.0	9.1	0.57	.066	8.6	-	0.6	10	-	-	17.9	
7.9	8.3	9.5	0.29	.032	9.1	-	0.8	11	-	-	19.5	
8.2	9.7	9.8	0.13	.018		-	0.9	13	-	-	16.7	
8.2	9.6	9.8	0.21	.029		-	1.0	10	-	-	25.6	
7.9	9.3	9.5	0.28	.037	7.6	0.3	3.0	8	-	-	24.9	
7.6	8.4	8.6	1.48	.140	10.6	-	1.0	8	-	-	19.8	

5A1a CATION EXCHANGE CAPACITY NH ₄ OAc	EXCHANGEABLE CATIONS 5B1b					5D2 EXCH. No %	8A1 SATURATION EXTRACT SOLUBLE					8A MOISTURE AT SATURATION %
	6F2a		6Q2a				6P1a	6Q1a	6J1a	6K1a	6L1a	
	Ca	Mg	H	Na	K		No	K	HCO ₃	Cl	SO ₄	
34.7						6	4.2	2.7				52.3
35.6						14	7.4	2.5				59.8
28.4						27	8.3	1.2				47.9
39.0						32	10.1	-				70.5
40.9						29	32.7	-	2.3	3.8	3.8	71.3
33.8						2	1.9	1.4				61.8

a. Composite irrigated surface sample from SW1/4 SW1/4 SW1/4 Section 34, T24N, R62W.

Soil type: Kim clay loam, alkali phase

Soil No.: S50Wyo-8-5

Location: Northwest quarter of northeast quarter of Section 4, T23N, R62W, Goshen County, Wyoming.

Vegetation: Sparse cover of western wheatgrass, herbs and weeds; virgin pasture.

Slope: North-facing colluvial slope of 2 percent gradient.

Described by: W. M. Johnson.

Horizon and

Mandan

Lab. Number

Al 535	0 to 3 inches. Light brownish gray (10YR 6/2.5 dry) to grayish brown (10YR 5/2.5 moist) with numerous tiny specks of very pale brown, hard, friable, plastic clay loam; weak subangular blocks crush to weak granules; strongly calcareous; moderate number of grass roots; indistinct boundary.
AC 536	3 to 8 inches. Light brownish gray (10YR 6/2.5 dry) to grayish brown (10YR 5/2.5 moist) hard, friable, plastic silty clay loam of moderate coarse granular structure; strongly calcareous; moderate number of roots.
C1ca 537	8 to 14 inches. Light brownish gray (10YR 6.5/2 dry, 6/2.5 moist) with numerous specks and spots of white, hard, friable silty clay loam containing many medium and coarse sand-sized particles of Brule siltstone; very weak coarse prisms break to weak irregular blocks; strongly calcareous; few roots.
C2ca 538	14 to 20 inches. Light gray (10YR 7/2.5 dry) to brown (10YR 5.5/3 moist) with a few very pale brown specks, very hard, friable, plastic light silty clay; very weak irregular prisms break to very weak irregular coarse blocks; strongly calcareous; few roots.
C3ca 539	20 to 60 inches. Light gray (10YR 7/2 dry) to brown (10YR 5/3 moist) with a few white spots; massive; hard, friable, plastic light silty clay; strongly calcareous; very few roots.

SOIL SURVEY LABORATORY Mandan, N. Dak.

OIL TYPE Kim **LOCATION** Goshen County, Wyoming
sandy clay loam, alkali phase

SOIL NOS. S52Wyo-8-3 **LAB. NOS.** 1248-1254

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		
0-3	Alp	0.4	4.0	6.4	16.3	25.3	22.8	24.8	49.3	9.1	-	scl
3-11 1/2	Al2	0.5	3.8	6.4	17.4	26.4	21.5	24.0	50.4	8.3	-	scl
11 1/2-15 1/2	B2	0.5	4.5	7.3	18.4	25.6	21.4	22.3	49.7	8.6	Tr.	scl
15 1/2-22	B3	0.1	1.6	3.6	11.4	19.3	33.4	30.6	38.8	21.3	-	cl
22-28	Bca	0.2	0.9	1.4	4.3	8.2	41.7	43.3	19.5	33.2	-	sic
28-45	Cu-ca	-	0.2	0.7	3.1	19.3	57.8	18.9	50.3	29.1	-	sil
45-60+	Cu	-	0.8	2.7	9.2	23.9	46.3	17.1	54.6	21.7	-	1
pH		ORGANIC MATTER				8A2	ELECTRI-CAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	NITRO-GEN %	C/N	EST% SALT (BUREAU CUP)	8A1a	CaCO ₃ equiv-alent %	GYPSUM me./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
8.0	9.1	9.4	0.96			-	3.4	2	-			13.7
7.9	9.1	9.4	0.81			-	3.5	2	-			13.3
8.0	9.4	9.5	0.40			0.23	4.4	1	-			13.4
8.4	9.7	9.8	0.36			0.22	4.0	13	-			21.1
8.8	9.8	10.0	0.35			0.36	4.4	24	-			27.9
8.6	9.7	9.8	0.14			0.42	8.7	13	-			16.9
8.6	9.6	9.8	0.09			0.34	6.0	8	-			13.5
5A1a CATION EXCHANGE CAPACITY NH ₄ OAc	EXCHANGEABLE CATIONS 5B1b					5D2	8A1 SATURATION EXTRACT SOLUBLE			8A MOISTURE AT SATURATION %		
	Ca	Mg	H	Na	K	EXCH. Na %	6P1a Na	6Q1a K				
	milliequivalents per 100g. soil						milliequivalents per liter					
22.0				5.1	2.5	23	31.	1.0				45.6
21.4				5.3	2.2	25	31.	0.8				44.8
20.6				7.6	1.4	37	42.	0.4				43.7
25.5				14.8	2.0	58	42.	0.2				66.8
30.9				21.5	2.8	70	56.	0.4				93.2
24.0				18.7	2.3	78	91.	0.8				52.7
21.9				17.1	2.0	78	78.	0.6				44.3

Soil type: Kim sandy clay loam, alkali phase

Soil No.: S52Wyo-8-3

Location: Goshen County, Wyoming; northwest quarter of southwest quarter of Section 36, T23N, R62W; 40 rods east of highway and about 100 feet south of railroad; photo 11-66.

Vegetation: Irrigated sugar beets.

Slope: Nearly level loess-filled valley.

Described by: C. J. Fox, October 1952.

Horizon and

Mandan

Lab. Number

Alp 1248	0 to 3 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) fine granular friable sandy clay loam; moderately calcareous; a moderate accumulation of salt efflorescence on surface; clear boundary.
A12 1249	3 to 11½ inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) friable clay loam with medium moderately developed prismatic blocky structure; crushes to medium moderately developed granules; moderately calcareous; gradual boundary.
B2 1250	11½ to 15½ inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) clay loam with coarse weakly prismatic blocky structure; blocky units crush to weak medium granules; moderately calcareous; friable; clear boundary.
B3 1251	15½ to 22 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) heavy silty clay loam with coarse weak prismatic blocky structure which crushes to weak medium granules; hard, friable; strongly calcareous; some fine roots; clear boundary.
Bca 1252	22 to 28 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) friable silty clay loam with coarse indistinct prismatic structure which crushes to fine weakly developed granules; strongly calcareous; clear boundary.
Cu-ca 1253	28 to 45 inches. Very pale brown (10YR 7/4 dry) to brown (10YR 5/3 moist) massive friable silt loam; moderately calcareous; gradual boundary.
Cu 1254	45 to 60 inches plus. Very pale brown (10YR 7/4 dry) to brown (10YR 5/3 moist) massive friable silt loam which is saturated with water; moderately calcareous.

SOIL TYPE Larimer LOCATION Platte County, Wyoming
 fine sandy loam (20 to 30 inches over gravel)

SOIL NOS. S58Wyo-16-4 LAB. NOS. 9269-9273

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	Ap	3.6	7.5	9.3	20.5	24.8	15.9	18.4	48.2	6.1	11	fs1
6-10	B2t	1.0	4.6	7.0	15.5	22.7	25.7	23.5	49.2	9.5	Tr.	sc1
10-19	B3ca	1.2a	3.4a	5.1a	13.0a	21.7a	31.9	23.7	48.6	13.8	4	1
19-30	Cca	5.7b	10.6b	12.8b	23.1b	15.8b	13.4	18.6	36.1	6.7	27	fs1
30-38+	Dca	26.9c	24.4c	13.9c	14.4c	6.1c	7.4	6.9	16.9	4.1	36	lcs

pH	8C1a			ORGANIC MATTER			8A2 EST% SALT (BUREAU CUP)	6E1a CaCO ₃ equiv- alent	MOISTURE TENSIONS		
	1:5	1:10	6A1a ORGANIC CARBON	6B1a NITRO- GEN	C/N	6E1a GYPSUM me./100g. SOIL			1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
lit	%			%			PER CM 6A1a	%	%		
8.0	8.3	8.6	0.80	0.086	9	<0.20	0.9	<1	8.4		
7.9	8.3	8.6	0.74	0.084	9	<0.20	0.7	1	10.4		
8.1	8.6	8.9	0.62	0.070	9	<0.20	0.8	12	10.2		
8.2	8.7	9.0	0.44	0.050	9	<0.20	1.0	18	7.8		
8.3	9.0	9.2	0.17			<0.20	1.1	18	4.2		

5A1a CATION EXCHANGE CAPACITY NF ₄ Ac	EXTRACTABLE CATIONS					5D2 EXCH. Na %	8A1 SATURATION EXTRACT SOL.		8A MOISTURE AT SATU- RATION %
	6N2b Ca	6O2b Mg	6H1a H	6P2a Na	6Q2a K		6P1a Na	6Q1a K	
milliequivalents per 100g. soil						milliequivalents per liter			
18.6	17.4	4.2	<0.1	0.3	0.6	1	1.6	0.2	44.2
20.5		5.1	<0.1	0.3	0.5	1	1.5	0.2	52.3
14.6		4.3	<0.1	0.4	0.2	2	2.1	0.1	48.8
9.2		3.0	<0.1	0.4	0.1	3	3.0	0.1	43.4
3.9		1.8	<0.1	0.2	0.1	2	2.9	0.1	30.8

a. Trace CaCO₃ concn.
 b. Few CaCO₃ concn.
 c. Common CaCO₃ concn.

Soil type: Larimer fine sandy loam, 20 to 30 inches over gravel

Soil No.: 858Wyo-16-4

Location: Platte County, Wyoming; southwest quarter of northeast quarter of northwest quarter of Section 5, T24N, R68W; beginning at northwest corner (center of road junction) then east 1862 feet and south 681 feet.

Physiographic position: High terrace.

Topography: Nearly level; 1/2 percent slope, north aspect.

Drainage: Well drained.

Vegetation: Cultivated.

Use: Irrigated cropland; 1958 dry beans.

Collected by: James Allen, Keith Young, A. J. Cline, and R. C. Kronenberger, October 7, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and
Lincoln
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- Ap
9269 0 to 6 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; very hard when dry, friable when moist; very weak medium subangular blocky structure breaking to weak very fine granules; noncalcareous; horizon temperature 17 degrees centigrade; lower boundary abrupt and smooth.
- B2t
9270 6 to 10 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown or grayish brown (10YR 4.5/2 moist) very fine sandy clay loam; hard when dry, friable when moist; weak medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; horizon temperature 15.5 degrees centigrade; lower boundary clear and wavy.
- B3ca
9271 10 to 19 inches. Light yellowish brown or pale yellow (2.5Y 6.5/3 dry) to light olive brown (2.5Y 5/3 moist) very sandy clay loam; hard when dry, friable when moist; weak to moderate medium subangular blocky structure; violently calcareous; this is a moderate horizon of lime accumulation with visible lime occurring as concretions; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; lower boundary clear and smooth; horizon temperature 15.5 degrees centigrade.
- Cca
9272 19 to 30 inches. White (2.5Y 8/2 dry) to pale yellow (2.5Y 7/3 moist) gravelly sandy clay loam; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in divided forms; approximately 30 percent of this is gravel and cobble; horizon temperature 15.5 degrees centigrade; lower boundary gradual and wavy.
- Dca
9273 30 to 38 inches plus. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/3 moist) gravelly loamy coarse sand; loose when dry or moist; single grained; violently calcareous; approximately 25 percent of this horizon is gravel and cobble; there is lime coating the gravel and cobble fragments; horizon temperature 15.5 degrees centigrade.

Note: Air temperature at time of sampling 19 degrees centigrade.

SOIL SURVEY LABORATORY Lincoln, Nebr. August 1959

SOIL TYPE Larimer LOCATION Platte County, Wyoming
 very fine sandy loam

SOIL NOS. 858Wyo-16-8 LAB. NOS. 9296-9300

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				
0-4	Al	4.4	6.7	6.5	22.8	37.4	13.3	8.9	63.3	3.2	7	vfsl	
4-6	AB	2.1	5.9	7.9	23.2	19.6	14.8	26.5	44.4	4.5	Tr.	scl	
6-10	B21t	1.9	5.0	6.5	18.3	18.1	21.3	28.9	43.9	7.1	Tr.	scl	
10-15	B22t	1.3	5.1	6.7	19.0	18.6	23.6	25.7	46.1	7.9	6	scl	
15-24	Cca	6.5a	10.6a	11.1a	21.6a	13.0a	16.3	20.9	32.8	9.3	26	scl	
pH		ORGANIC MATTER				8A2		6E1a		MOISTURE TENSIONS			
1:1		6A1a		6B1a		EST% SALT (BUREAU CUP)		ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMHOS PER CM 6A1a		GYPSUM me./100g. SOIL		4B2	
1:5		1:10		ORGANIC CARBON %	NITRO-GEN %	C/N		CoCO ₂ equivalent %		1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %	
8.0	8.2	8.2	1.09	0.088	12.4	<0.20	0.7	1				4.6	
7.8	8.1	8.3	1.17	0.118	9.9	<0.20	0.5	Δ				10.2	
7.9	8.3	8.4	0.96	0.098	10	<0.20	0.5	Δ				11.1	
8.0	8.4	8.6	0.84	0.090	9	<0.20	0.5	Δ				10.2	
8.1	8.6	8.9	0.60	0.076	8	<0.20	0.5	28				9.6	
5A1a		EXTRACTABLE CATIONS 5B1a					5D2		8A1 SATURATION EXTRACT SOL.			8A	
CATION EXCHANGE CAPACITY NH ₄ Ac		6N2b	6O2b	6H1a	6P2a	6Q2a	EXCH. No %		6P1a	6Q1a			MOISTURE AT SATURATION %
		milliequivalents per 100g. soil							milliequivalents per liter				
9.5		1.3	0.4	<0.1	0.9	Δ			0.3	1.0			49.2
21.8	20.8	2.5	0.4	<0.1	0.7	Δ			0.3	0.2			55.3
24.2	22.2	3.1	0.4	<0.1	0.6	Δ			0.3	0.2			52.0
21.5		3.3	<0.1	<0.1	0.5	Δ			0.3	0.1			50.6
8.6		1.8	<0.1	0.1	0.1	1			0.6	0.1			42.0

a. Common CaCO₃ coner.

Soil type: Larimer very fine sandy loam

Soil No.: 858Wyo-16-8

Location: Platte County, Wyoming; northeast quarter of southwest quarter of southwest quarter of Section 33, T24N, R68W; starting at southwest corner (center of crossroads), then east one quarter mile, north along fence line 1074 feet and then west 309 feet.

Physiographic position: High terrace.

Topography: Nearly level; 1 percent slope, northeast aspect.

Drainage: Well drained.

Vegetation: Buffalograss, blue grama, woolly plantain, green sagewort, yucca, and cacti.

Use: Pasture.

Collected by: James Allen, Keith Young, A. J. Cline, R. C. Kronenberger, and Fraser Stephens, October 8, 1958.

Described by: A. J. Cline, and Fraser Stephens.

Horizon and
Lincoln
Lab. Number

- A1 0 to 4 inches. Grayish brown or light brownish gray (10YR 5.5/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; soft when dry, very friable when moist; moderate very fine granular structure; noncalcareous; horizon temperature 21 degrees centigrade; lower boundary clear and smooth.
- AB 4 to 6 inches. Grayish brown or brown (10YR 5/2.5 dry) to dark grayish brown or dark brown (10YR 4/2.5 moist) light clay loam; very hard when dry, friable when moist; weak coarse prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; horizon temperature 20 degrees centigrade; lower boundary clear and smooth.
- B21t 6 to 10 inches. Brown (10YR 5/3 dry) to dark brown (10YR 4/3 moist) clay loam; very hard when dry, friable when moist; moderate medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; horizon temperature 19.5 degrees centigrade; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; lower boundary clear and smooth.
- B22t 10 to 15 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) clay loam; very hard when dry, friable when moist; weak to moderate medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; this horizon has a few gravel fragments in the lower three inches; horizon temperature 19.5 degrees centigrade; lower boundary clear and wavy.
- Cca 15 to 24 inches. Pale yellow (2.5Y 8/3 dry) to light yellowish brown (2.5Y 6/3 moist) gravelly sandy clay loam; hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring as concretions and in finely divided forms; approximately 20 percent of this horizon is gravel and cobble; lower boundary gradual and wavy; horizon temperature 19.5 degrees centigrade.
- D 24 to 30 inches plus. (Not sampled) Gravelly and cobbly sand; violently calcareous with moderate amounts of lime coating on the rocks particularly in the upper part of the horizon; approximately 40 to 60 percent of the horizon is coarse gravel and cobbles.

Note: Air temperature at the time of sampling 20.5 degrees centigrade.

SOIL TYPE Larimer LOCATION Platte County, Wyoming
sandy loam

SOIL NOS. S58Wyo-16-9 LAB. NOS. 9301-9305

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	2A2 0.02-0.002	> 2 (19mm)	
0-2	A1	7.0	11.9	12.5	20.4	21.4	15.0	11.8	44.7	4.6	13	sl
2-4	AB	3.8	10.9	13.8	24.2	18.9	11.9	16.5	41.8	4.2	8	fsl
4-11	B2t	1.1	8.6	13.0	21.9	15.3	14.6	25.5	37.9	5.2	7	scl
11-15	B3ca	5.6a	12.2a	12.2a	18.4a	10.7a	15.7	25.2	28.5	8.4	26	scl
15-25	Cca	14.4a	15.3a	10.2a	14.9a	11.1a	16.4	17.7	27.7	8.6	34	cosl
pH		8C1a	ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	MOISTURE TENSIONS			4B2
	1:5	1:10	6A1a ORGANIC CARBON	6B1a NITROGEN	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CoCO ₃ equivalent	GYPSSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:1		%	%			8A1a	%		%	%	%
7.7	8.2	8.3	1.14	0.103	11.1	<0.20	0.6	1				4.9
7.9	8.2	8.3	1.02	0.104	9.8	<0.20	0.6	<1				6.3
7.8	8.2	8.5	0.90	0.091	10	<0.20	0.6	<1				9.6
7.9	8.3	8.6	1.49	0.161	9	<0.20	0.7	17				11.6
8.1	8.7	9.0	0.40	0.041	10	<0.20	0.5	30				7.7
5A1a		EXTRACTABLE CATIONS				5B1a	SATURATION		EXTRACT SOL		8A	
CATION EXCHANGE CAPACITY NH ₄ Ac	6N2b	6O2b	6H1a	6P2a	6Q2a	5D	6P1a	6Q1a			MOISTURE AT SATURATION	
	Ca	Mg	H	Na	K	EXCH. No %	No	K	← milliequivalents per liter →		%	
← milliequivalents per 100g. soil →												
10.4		1.6	0.4	0.1	0.8	0.1	0.2	0.8			33.9	
14.0		1.3	0.4	0.1	0.4	0.1	0.2	0.2			41.2	
20.9		2.0	0.4	0.1	0.4	0.1	0.3	0.1			48.7	
14.3		2.1	<0.1	0.1	0.2	0.1	0.4	0.1			51.2	
6.3		1.8	<0.1	0.1	0.1	0.1	0.6	0.1			39.1	

a. Common CaCO₃ concr.

Soil type: Larimer sandy loam

Soil No.: S58Wyo-16-9

Location: Platte County, Wyoming; southwest quarter of southeast quarter of northeast quarter of Section 28, T24N, R68W; starting at steel bolt on west end of concrete drop in lateral No. 1 (approximately 730 feet west of east quarter corner of section), then west 127 feet and north 239 feet.

Physiographic position: High terrace.

Topography: Nearly level; 1 percent slope, northeast aspect.

Drainage: Well drained.

Vegetation: Buffalograss, blue grama, green sagewort, wild buckwheat, and yucca.

Use: Pasture.

Collected by: James Allen, Keith Young, A. J. Cline, R. C. Kronenberger, and Fraser Stephens, October 8, 1958.

Described by: A. J. Cline and Fraser Stephens.

Horizon and

Lincoln

Lab. Number

- A1 0 to 2 inches. Gray or grayish brown (10YR 5/1.5 dry) to dark gray to dark grayish brown (10YR 4/1.5 moist) light sandy loam; soft when dry, very friable when moist; moderate very fine granular structure; noncalcareous; lower boundary clear and smooth.
- 9301
- AB 2 to 4 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) light sandy clay loam; hard when dry, very friable when moist; weak medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; there is some gravel in this horizon but less than 5 percent of the volume is gravel or cobble; lower boundary clear and smooth.
- 9302
- B2t 4 to 11 inches. Brown (10YR 5/3 dry) to brown or dark brown (10YR 4/3 moist) sandy clay loam; hard when dry, very friable when moist; moderate medium prismatic structure breaking to moderate medium subangular blocks; noncalcareous; approximately 5 percent of this horizon is gravel; there are thin nearly continuous clay skins on the surfaces of the soil aggregates; lower boundary gradual and wavy.
- 9303
- B3ca 11 to 15 inches. Brown or pale brown (10YR 5.5/3 dry) to brown (10YR 4.5/3 moist) gravelly sandy clay loam; slightly hard when dry, very friable when moist; weak medium subangular blocky structure; violently calcareous; this is a moderate horizon of lime accumulation with visible lime occurring in the form of concretions; there are thin patchy clay skins on both the horizontal and vertical faces of the soil aggregates; approximately 20 percent of this horizon is gravel; lower boundary gradual and wavy.
- 9304
- Cca 15 to 25 inches. White (10YR 8/2 dry) to very pale brown (10YR 7/3 moist) gravelly loamy sand; slightly hard when dry, very friable when moist; massive; violently calcareous; this is a strong horizon of lime accumulation with visible lime occurring in finely divided forms; approximately 20 percent of this horizon is gravel; lower boundary diffuse and wavy.
- 9305
- D 25 to 40 inches plus. Loose calcareous sand and gravel substratum; approximately 40 percent of the horizon is coarse gravel and cobble; in the upper portion of the horizon the rocks have a coating of lime and there are some strata throughout the horizon which have a very high content of lime in finely divided forms; this horizon not sampled for laboratory study.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell loam **LOCATION** Goshen County, Wyoming

SOIL NOS. S50Wyo-8-4 **LAB. NOS.** 527-534

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1Fla		3A1					2A2		> 2 (9mm)		
		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	Tr.				
0-2	A1	-	1.4	1.0	5.1	42.8	36.0	13.7	70.5	12.0	-	1	
2-6	C1	0.3	0.6	0.9	5.4	36.6	47.4	8.8	70.0	17.9	-	1	
6-9	C2	1.2	3.5	4.1	8.5	32.1	39.5	11.1	62.5	14.3	2	1	
9-28	C3	-	0.9	1.7	7.3	36.9	44.0	9.2	68.2	17.8	-	1	
28-33	C4	-	0.4	0.6	3.9	28.9	42.9	23.3	52.3	22.7	-	1	
33-46	C5	-	0.2	0.4	2.9	22.2	50.5	23.8	44.7	30.3	-	sil	
46-62	C6	-	0.2	0.2	1.8	20.8	56.8	20.2	45.6	33.5	-	sil	
a		2.0	6.5	9.0	19.9	21.9	23.2	17.5	46.4	9.8	Tr.	fsl	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a.	6E1a	6F1a	MOISTURE TENSIONS			
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	CaCO ₃ equiv-alem %	GYPSUM me./100g SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	4E2	
7.7	8.3	8.5	1.66	.156	10.6	-	0.5	1	-	-	-	10.8	
7.9	8.7	8.9	0.70	.064	10.9	-	0.4	5	-	-	-	11.2	
8.0	8.6	8.9	0.96	.089	10.8	-	0.4	3	-	-	-	9.2	
7.9	8.9	9.0	0.40	.045	8.9	-	0.4	6	-	-	-	10.7	
7.8	8.6	8.8	1.11	.111	10.0	-	0.8	1	-	-	-	14.7	
7.8	8.5	8.7	0.70	.080	8.8	-	2.6	9	-	-	-	17.7	
7.9	8.8	9.0	0.30	.042	7.1	-	1.5	10	-	-	-	17.2	
7.8	8.6	8.8	0.72	.075	9.6	-	1.0	3	-	-	-	10.2	
5A1a CATION EXCHANGE CAPACITY NH ₄ OAc		EXCHANGEABLE CATIONS 5B1b					5D2	8A1 SATURATION EXTRACT SOLUBLE					8A
		Ca	Mg	H	Na	K	EXCH. No %	6P1a Na	6Q1a K	6J1a HCO ₃	6K1a Cl	6L1a SO ₄	MOISTURE AT SATURATION %
		milliequivalents per 100g. soil						milliequivalents per liter					
23.6				0.6	2.5	2	-	0.8					48.5
25.1				0.4	2.6	2	-	0.8					47.7
21.9				0.4	1.6	2	1.4	0.7					41.1
24.5				0.6	2.0	2	0.7	-					43.2
31.5				1.0	2.6	3	3.3	10.3					48.4
31.8				0.8	3.6	2	13.8	10.1	3.5	5.2	-		53.4
31.3				1.5	4.3	5	5.8	8.6					52.2
19.6				0.5	1.9	2	3.2	3.7					34.7

a. Composite irrigated surface sample from SEL/4 NEL/4 NEL/4 Sec. 29, T24N, R61W.

Soil type: Mitchell loam

Soil No.: S50Wyo-8-4

Location: Southeast quarter of southwest quarter of southwest quarter of Section 17, T25N, R63W, Goshen County, Wyo.

Vegetation: Good cover of blue grama, threadleaf sedge and needlegrass; virgin pasture.

Slope: Colluvial slope of 2 percent gradient.

Described by: W. M. Johnson.

Horizon and

Mandan

Lab. Number

A1 527	0 to 2 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) soft friable weak coarse and medium granular coarse loam; mildly calcareous; grass roots very numerous; clear boundary.
C1 528	2 to 6 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) soft friable coarse silt loam; weak subangular blocks crush to weak coarse and medium granules; strongly calcareous; roots numerous; clear boundary.
C2 529	6 to 9 inches. Mixed very pale brown and light brownish gray (10YR 7/2.5 and 6/2 dry) to brown and dark grayish brown (10YR 5/2.5 and 4/2 moist) soft friable coarse silt loam containing a few 1/4- to 1/2-inch pebbles; weak prisms break to weak irregular blocks that in turn crush to weak coarse granules; strongly calcareous; roots numerous; clear boundary.
C3 530	9 to 28 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3.5 moist) weak prismatic soft friable coarse silt loam that breaks to weak irregular blocks; very strongly calcareous; moderate number of roots; clear boundary.
C4 531	28 to 33 inches. Mixed light brownish gray and grayish brown (10YR 6.5/2 and 5/2 dry) to dark grayish brown (10YR 4/2 moist) weak fine subangular blocky, slightly hard, friable silt loam that crushes to weak coarse granules; mildly calcareous; moderate number of roots; gradual boundary.
C5 532	33 to 46 inches. Very pale brown (10YR 7/2.5 dry) to brown (10YR 5/3.5 moist) hard friable weak irregular blocky heavy silt loam; very strongly calcareous; few roots; diffuse boundary.
C6 533	46 to 62 inches. Very pale brown (10YR 7.5/3 dry) to light yellowish brown (10YR 6/4 moist) hard friable massive heavy silt loam; very strongly calcareous; very few roots.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell loam **LOCATION** Goshen County, Wyoming

SOIL NOS. S52Wyo-8-1 **LAB. NOS.** 1231-1237

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	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			
0-3 1/2	Alp	0.2	0.6	1.3	9.4	39.6	35.2	13.7	69.5	11.7	-	1
3 1/2-8 1/2	Al2	0.1	0.4	1.5	8.7	39.5	35.6	14.2	69.3	12.0	-	1
8 1/2-15	AC	0.1	0.2	0.8	6.4	42.0	37.9	12.6	71.4	13.4	-	1
15-28	Cl1	0.2	0.7	1.7	9.0	38.0	36.5	13.9	68.3	12.6	-	1
28-41	Cl2	0.1	0.5	1.6	8.7	38.8	36.4	13.9	69.6	11.9	-	1
41-54	Cl3	0.1	0.3	1.0	17.4	31.4	37.6	12.2	71.5	13.2	-	1
50-60+	Cl4	-	0.4	0.9	6.8	48.8	33.9	9.2	77.3	10.7	-	vfs1
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a	8C1a	6A1a			EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM @ 25°C	CaCO ₃ equiv-alemt	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:5	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N				%		%	%	%
7.9	8.7	8.9	1.03			-	0.8	1	-			9.9
7.8	8.7	8.9	0.95			-	0.8	1	-			9.5
7.8	8.8	8.9	0.57			-	0.8	4	-			10.2
7.9	8.9	9.0	0.31			-	0.6	5	-			9.0
7.9	9.0	9.1	0.25			-	0.7	4	-			9.0
8.0	9.1	9.3	0.25			-	0.6	4	-			9.7
8.0	9.1	9.3	0.22			-	0.6	4	-			9.8
5A1a	EXCHANGEABLE CATIONS				5B1b	5D2 8A1 SATURATION EXTRACT SOLUBLE				8A		
CATION EXCHANGE CAPACITY NH ₄ OAc	Ca	Mg	H	Na	K	EXCH. Na %	6P1a	6Q1a				MOISTURE AT SATURATION %
	milliequivalents per 100g. soil						milliequivalents per liter					
23.8				0.4	2.0	2	2.2	0.8				42.4
20.2				0.4	1.5	2	2.2	0.5				43.7
19.0				0.4	1.1	2	1.7	0.2				41.7
16.6				0.4	0.8	2	1.5	-				40.1
17.6				0.4	1.3	2	1.7	0.2				37.4
18.2				0.5	1.8	3	1.7	0.5				37.1
18.9				0.2	1.9	1	1.3	0.8				39.5

Soil type: Mitchell loam

Soil No.: S52Wyo-8-1

Location: Goshen County, Wyoming; northeast corner of northwest quarter of southwest quarter of Section 13, T24N, R62W; 375 feet south and 175 feet east of intersection of field trail and head of drainage ditch.

Vegetation: Cultivated; irrigated alfalfa.

Slope: About 1 percent slope to the northeast.

Described by: C. J. Fox, October 1952.

Horizon and

Mandan

Lab. Number

Alp 1231	0 to 3½ inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) friable, weak fine granular loam; moderately calcareous; clear boundary; 42 degrees F. at 2½ inches.
A12 1232	3½ to 8½ inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) friable, single grain and weak fine granular loam; firm when dry; strongly calcareous; clear boundary.
AC 1233	8½ to 15 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) weak coarse, prismatic silt loam; prisms break to weak coarse irregular blocks which crush to weak very fine granules; friable; strongly calcareous; clear boundary.
C11 1234	15 to 28 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) friable weak irregular blocky silt loam which crushes to weak very fine granules; strongly calcareous; gradual boundary.
C12 1235	28 to 41 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) friable weak fine granular silt loam; strongly calcareous; gradual boundary.
C13 1236	41 to 54 inches. Pale brown (10YR 6/3 dry) to yellowish brown (10YR 5/4 moist) friable weak fine granular and single grain silt loam; strongly calcareous; gradual boundary; 56 degrees F. at 52 inches.
C14 1237	54 to 60 inches plus. Pale brown (10YR 6/3 dry) to yellowish brown (10YR 5/4 moist) friable weak fine granular silt loam; strongly calcareous; alfalfa roots penetrate to almost 5 feet.

Note: Scattered small (1/8- to 1/2-inch) chips and fragments of Brule siltstone occur in all horizons.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell **LOCATION** Goshen County, Wyoming
loam

SOIL NOS. S52Wyo-8-4 **LAB. NOS.** 1255-1259

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a VERY COARSE SAND	1-0.5 COARSE SAND	0.5-0.25 MEDIUM SAND	0.25-0.10 FINE SAND	0.10-0.05 VERY FINE SAND	0.05-0.002 SILT	< 0.002 CLAY	0.2-0.02 3A1	0.02-0.002 3A1	2A2 > 2	
0-6 1/2	Alp	0.7	2.2	3.4	9.4	22.6	44.8	16.9	54.2	19.2	-	1
6 1/2-22	AC	2.3	6.0	6.1	14.3	17.5	37.4	16.4	44.7	18.8	-	1
22-36	C11	3.3	7.6	6.7	15.6	17.7	38.0	11.1	46.8	18.4	-	1
36-50	C12	3.4	10.0	7.4	14.9	17.8	37.4	9.1	46.2	18.0	-	fs1
50-62	C13	5.1	9.0	6.9	14.5	19.3	38.3	6.9	49.1	17.4	-	fs1
pH		ORGANIC MATTER			8A2	ELECTRI- CAL CONDUCT- IVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a	6F1a	MOISTURE TENSIONS			4B2
8C1b SATU- RATED PASTE	8C1a pH	8C1a 1:5	6A1a ORGANIC CARBON %	NITRO- GEN %	C/N	EST% SALT (BUREAU CUP)	CoCO ₃ equiv- alent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %	
7.5	8.3	8.5	1.63			-	2	-				14.7
7.6	8.6	8.8	0.92			-	10	-				17.3
7.8	8.9	9.1	0.34			-	9	-				16.2
8.2	8.9	9.1	0.20			-	10	-				16.2
8.2	9.4	9.6	0.06			-	8	-				16.0
5A1a CATION EXCHANGE CAPACITY NH ₄ OAc	EXCHANGEABLE CATIONS					5B1b	5D2	SATURATION EXTRACT SOLUBLE			8A MOISTURE AT SATU- RATION %	
	Ca	Mg	H	Na	K	EXCH. Na %	6P1a Na	6Q1a K				
	milliequivalents per 100g. soil						milliequivalents per liter					
28.5				0.5	1.9	2	2.2	0.6				47.2
29.3				0.5	2.1	2	1.3	0.4				47.0
29.1				1.7	2.6	6	5.0	0.4				43.1
28.5				5.4	2.0	19	10.9	0.2				40.4
29.0				6.5	1.7	22	11.7	0.2				42.3

Soil type: Mitchell loam

Soil No.: S52Wyo-8-4

Location: Goshen County, Wyoming; northwest quarter of northwest quarter of northwest quarter of Section 11, T23N, R61W; 30 rods south and about 20 rods east of road intersection at northwest corner of section; photo 14-36.

Vegetation: Cultivated; recently cultivated after removal of this year's crop.

Slope: Upland slope to north, 3 percent.

Described by: C. J. Fox, October 1952.

Horizon and

Mandan

Lab. Number

Alp 1255	0 to 6½ inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) weak fine granular loam; moderately calcareous; soft, very friable; clear boundary; 40 degrees F. at 2 inches; air temperature 44 degrees F. at 9:30 A.M.
AC 1256	6½ to 22 inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) friable weak fine granular silt loam containing occasional tiny Brule fragments; strongly to very strongly calcareous; clear boundary; 54 degrees F. at depth of 12 inches.
C11 1257	22 to 36 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) friable weak fine granular silt loam; very strongly calcareous; 58 degrees F. at depth of 24 inches; 60 degrees at 36 inches.
C12 1258	36 to 50 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) friable weak fine granular silt loam; strongly calcareous; 60 degrees F. at depth of 48 inches.
C13 1259	50 to 62 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 dry) friable weak fine granular silt loam containing occasional tiny Brule fragments; strongly calcareous; 60 degrees F. at 60 inches.

Note: Occasional nests of gypsum crystals occur in the profile below 24 inches.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell **LOCATION** Goshen County, Wyoming
loam

SOIL NOS. S52Wyo-8-6 **LAB. NOS.** 1267-1272

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		1B1a		3A1				2A2		TEXTURAL CLASS		
		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				
0-3 1/2	Alp	1.6	4.0	5.0	11.7	24.1	39.6	14.0	52.6	18.3	-	1
3 1/2-8	Al2	0.9	4.4	5.3	12.2	24.2	38.9	14.1	52.7	17.8	-	1
8-16	AC	1.3	4.4	5.0	11.9	23.9	41.1	12.4	53.1	19.4	-	1
16-28	Cl1	2.6	5.3	4.4	10.2	21.6	46.4	9.5	51.0	23.6	-	1
28-42	Cl2	0.5	2.3	3.4	11.6	13.7	57.7	10.8	55.2	24.1	-	sil
42-60	Cl3	0.2	1.0	1.7	7.9	35.7	43.9	9.6	57.9	27.4	-	1
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a	8C1a	6A1a	NITROGEN	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM 8A1a	CaCO ₃ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2 15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	%						%	%	%
7.5	8.5	8.8	0.97			-	2.0	7	-			11.9
7.6	8.6	8.9	0.96			-	1.1	7	-			12.2
7.6	8.8	9.0	0.52			-	1.2	11	-			13.2
7.6	8.8	9.0	0.28			-	1.1	12	-			12.6
7.8	9.1	9.2	0.22			-	1.1	9	-			12.4
7.7	9.0	9.2	0.18			-	1.2	8	-			12.8
5A1a	EXCHANGEABLE CATIONS					5B1b	5D2	SATURATION EXTRACT SOLUBLE			8A	
CATION EXCHANGE CAPACITY NH ₄ OAC	Ca	Mg	H	Na	K	EXCH. No %	6P1a	6Q1a			MOISTURE AT SATURATION	
	milliequivalents per 100g. soil						milliequivalents per liter				%	
22.4				0.5	2.5	2	4.8	1.7			40.0	
22.5				0.5	2.5	2	3.0	1.0			39.3	
23.2				0.9	1.5	4	5.0	0.4			40.9	
22.8				0.7	1.9	3	4.3	0.4			40.2	
23.4				0.9	2.7	4	5.0	0.6			37.2	
24.2				1.2	2.9	5	6.5	0.8			39.3	

Soil type: Mitchell loam

Soil No.: 852Wyo-8-6

Location: Goshen County, Wyoming; southwest corner of northeast quarter of southeast quarter of Section 5, T24N, R62W; 150 feet north of small lateral and about 600 feet southeast of row of trees.

Vegetation: Cultivated; recently in irrigated beans.

Slope: 2 percent slope to north.

Described by: C. J. Fox, October 1952.

Horizon and

Mandan

Lab. Number

- A1p 0 to 3½ inches. Pale brown (10YR 6/3 dry) to dark brown (10YR 4/3 moist) weak fine granular loam containing occasional tiny Brule fragments; very friable when moist, hard when dry; strongly calcareous; clear boundary.
- 1267
- A12 3½ to 8 inches. Pale brown (10YR 6/3 dry) to dark grayish brown (10YR 4/2 moist) very weak fine granular silt loam containing occasional tiny Brule fragments; friable when moist, hard when dry; strongly calcareous; clear boundary.
- 1268
- AC 8 to 16 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) very friable weak fine granular silt loam with many tiny Brule fragments; occasional worm casts containing worm excrement; strongly calcareous; gradual boundary.
- 1269
- C11 16 to 28 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) massive silt loam containing occasional tiny Brule fragments; some fine roots; soil is very wet; strongly calcareous; gradual boundary.
- 1270
- C12 28 to 42 inches. Very pale brown (10YR 7/3 dry) to yellowish brown (10YR 5/4 moist) massive silt loam with occasional tiny Brule fragments; soil is water saturated; strongly calcareous; gradual boundary.
- 1271
- C13 42 to 60 inches. Very pale brown (10YR 7/3 dry) to yellowish brown (10YR 5/4 moist) massive water-logged silt loam containing small Brule fragments; some fine roots at 5 feet; strongly calcareous.
- 1272

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Mitchell LOCATION Goshen County, Wyoming
loam

SOIL NOS. S52Wyo-8-7 LAB. NOS. 1273-1278

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	0.2-0.07	0.02-0.002	> 2			
0-8	Alp	0.1	0.3	1.2	5.4	41.9	32.1	19.0	69.0	9.1	-	1
8-16	AC	-	0.2	0.7	3.2	31.9	42.2	21.8	61.3	15.3	-	1
16-27	C11	-	-	0.1	0.9	19.4	59.3	20.3	53.6	25.8	-	sil
27-35	C12	-	-	0.1	0.9	23.2	60.4	15.4	61.2	23.2	-	sil
35-54	C13	-	-	0.2	1.7	31.9	51.5	14.7	67.7	17.1	-	sil
54-62	C14	-	0.1	0.3	1.9	37.7	47.0	13.0	70.9	15.4	-	1
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM	6E1a	6F1a	MOISTURE TENSIONS		
8c1b SATURATED PASTE	8C1a	8C1a	6A1a ORGANIC CARBON %	NITROGEN %	C/N	EST% SALT (BUREAU CUP)	8A1a	CaCO ₃ equivalent %	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:5	1:10											
7.5	8.6	8.8	0.87			-	0.9	-	-			10.3
7.5	8.8	8.9	0.67			-	1.0	2	-			12.8
7.6	9.2	9.3	0.45			-	0.8	17	-			14.3
7.7	9.2	9.4	0.22			-	0.7	10	-			11.2
7.8	9.3	9.4	0.13			-	1.1	7	-			9.6
8.2	9.7	9.9	0.13			-	1.0	6	-			9.0
5A1a	EXCHANGEABLE CATIONS					5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A
CATION EXCHANGE CAPACITY NH ₄ OAc	Ca	Mg	H	6P2a Na	6Q2a K	EXCH. No %	6P1a Na	6Q1a K			MOISTURE AT SATURATION	
	milliequivalents per 100g. soil						milliequivalents per liter				%	
20.7				0.3	1.6	1	3.0	0.6			39.6	
24.6				0.3	1.8	1	2.2	0.6			47.0	
24.4				0.3	2.6	1	1.5	1.0			48.4	
22.2				0.3	3.5	1	1.5	1.3			42.6	
20.7				1.1	3.5	5	5.6	1.4			38.6	
20.8				3.0	3.1	14	9.1	0.6			39.6	

Soil type: Mitchell loam

Soil No.: S52Wyo-8-7

Location: Goshen County, Wyoming; southwest corner of southwest quarter of Section 31, T23N, R60W; about 500 feet east and 200 feet north of curve in blacktop road; photo 15-64.

Vegetation: Cultivated; recently in irrigated beans.

Slope: About 2 percent gradient in ridge top.

Described by: C. J. Fox, October 1952.

Horizon and

Mandan

Lab. Number

Alp 0 to 8 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) weak fine granular loam; friable when moist, hard when dry; moderately calcareous; clear boundary.

AC 8 to 16 inches. Light yellowish brown (10YR 6/4 dry) to dark brown (10YR 4/3 moist) friable silt loam; weak medium prismatic-subangular blocky structure which crushes to very weak fine granules; some roots and organic staining; moderately calcareous; clear boundary.

C11 16 to 27 inches. Very pale brown (10YR 7/3 dry) to pale brown (10YR 6/3 moist) friable weak fine granular silt loam; strongly calcareous; gradual boundary.

C12 27 to 35 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) friable massive silt loam; strongly calcareous.

C13 35 to 54 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) friable massive silt loam; strongly calcareous.

C14 54 to 62 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) friable massive silt loam; strongly calcareous.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Otero **LOCATION** Goshen County, Wyoming
fine sandy loam

SOIL NOS. S53Wyo-8-5 **LAB. NOS.** 1907-1913

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	1.7	9.5	13.7	24.0	23.4	12.9	14.8	44.5	4.9	Tr.	fsl
5-16	AC	0.5	12.0	17.6	26.2	17.7	9.7	16.3	36.2	4.6	-	sl
16-24	C1	-	9.8	18.7	26.5	19.4	10.8	14.8	38.7	4.7	-	fsl
24-33	C2	0.3	7.8	14.4	24.5	21.6	14.8	16.6	43.0	6.3	-	fsl
33-38	C3	-	12.5	18.8	28.4	17.8	9.2	13.3	37.3	4.1	-	sl
38-46	C4	0.5	14.6	19.8	28.0	17.2	7.8	12.1	36.1	3.2	-	sl
46-60	IIC5	-	1.7	4.3	17.3	39.7	21.1	15.9	64.1	8.2	-	vfs1

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a	6A1a	6A1a	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equivalent	GYP SUM me./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	4B2
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N			%		%	%	15 ATMOS. %
7.6	8.2	8.4	0.59			<0.20	1.3	2				7.3
7.6	8.4	8.5	0.34			<0.20	0.6	7				7.7
7.7	8.5	8.6	0.21			<0.20	0.6	6	-			7.0
7.6	8.4	8.8	0.19			<0.20	0.6	6	-			7.6
7.7	8.8	8.9	0.13			<0.20	0.6	5	-			5.8
7.7	8.8	9.0	0.07			<0.20	0.6	5	-			6.3
7.8	8.8	9.1	0.12			<0.20	0.7	5	-			8.0

5A1a	5B1a	CATIONS		5B1b	5D2	SATURATION EXTRACT SOLUBLE		8A		
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE		EXCH. Na %	6P1a	6Q1a	MOISTURE AT SATURATION %		
	Ca	6Q2b Mg	H	6P2a Na		6Q2a K	Na		K	
		← milliequivalents per 100g. soil →						← milliequivalents per liter →		
14.8		1.8		0.1	1.1	1	0.6	1.0	30.1	
11.8		1.8		0.2	0.6	2	0.6	0.4	31.0	
11.6		2.4		0.2	0.8	2	0.6	0.4	29.1	
12.6		3.2		0.4	1.3	3	0.9	0.8	30.0	
9.6		2.7		0.4	1.1	4	0.9	0.8	24.8	
9.6		3.0		0.4	1.2	4	1.7	0.8	23.6	
15.9		4.3		0.9	2.4	6	3.8	0.8	30.1	

Soil type: Otero fine sandy loam

Soil No.: S53Wyo-8-5

Location: Goshen County, Wyoming; northeast corner of northeast quarter of Section 5, T22N, R62W; 50 feet south of road; photo 9-62.

Vegetation: Cultivated; fallow strip.

Slope: 5 percent upland; plane, faces southwest; well drained.

Parent material: Eolian sand, silt and clay, derived mainly from Brule and Chadron beds (Oligocene).

Described by: C. J. Fox, September 24, 1953.

Horizon and

Mandan

Lab. Number

Alp 1907	0 to 5 inches. Brown (10YR 5/3 dry) or very dark grayish brown (10YR 3/2 moist) friable moderately calcareous weak fine granular fine sandy loam; slightly hard when dry; many roots; abrupt smooth boundary.
AC 1908	5 to 16 inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/3 moist) moderately calcareous friable weak coarse prismatic angular blocky heavy sandy clay loam; structural units coated slightly darker and crush to single grains and weak fine granules; soil slightly hard when dry; many roots; gradual smooth boundary.
C1 1909	16 to 24 inches. Light yellowish brown (10YR 6/4 dry) or yellowish brown (10YR 5/4 moist) strongly calcareous very coarse weak prismatic clay loam; units coated; crush to fine weak granules; friable when moist and slightly hard when dry; some fine roots; gradual smooth boundary.
C2 1910	24 to 33 inches. Light yellowish brown (10YR 6/4 dry) or yellowish brown (10YR 5/4 moist) strongly calcareous friable very coarse weak prismatic sandy clay loam; crushes to single grains and weak fine crumbs; gradual smooth boundary.
C3 1911	33 to 38 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) strongly calcareous very friable sandy clay loam; gradual smooth boundary.
C4 1912	38 to 46 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) strongly calcareous very friable sandy clay loam; few roots; gradual smooth boundary.
IIC5 1913	46 to 60 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) moderately calcareous finely porous very friable very fine sandy loam; an occasional fine root hair in upper part.

SOIL TYPE Ptarmigan stony loam LOCATION Park County, Wyoming

SOIL NOS. S61Wyo-15-1 LAB. NOS. 15750-15758, 15794

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1									2A2 > 2 ($\leq 19\mu$)	TEXTURAL CLASS
		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	Bulk Density			
2-0	0	a	a	a	a	a	a	a	a	a	20	
0-2	A11	22.1	9.7	4.1	8.6	6.2	37.6	11.7	30.9	17.7	34	1
2-9	A12	32.5	19.2	6.0	8.2b	4.3b	20.7	9.1	17.2	11.5	52	cos1
9-13	B21ir	19.6	18.9	9.1	15.5b	8.2b	23.6	5.1	26.9	12.7	42	cos1
13-25	B22ir	17.2	15.0	7.5	14.3b	9.9b	31.9	4.2	33.8	15.5	33	cos1
25-34	B23ir	19.1	15.5	7.2	12.9b	8.1b	33.0	4.2	29.9	17.8	34	cos1
34-45	B24ir	23.2	20.9	9.7	15.9b	8.0b	18.3	4.0	25.8	8.4	34	lcos
45-54	IIIC1	27.2	24.8	11.6	17.5b	7.3b	9.7	1.9	21.7	3.6	51	lcos
54-76	IIIC2	23.4	19.0	9.2	14.5b	7.7b	22.4	3.8	27.8	9.3	28	lcos/cos1
54-76	c	2.9	3.6	2.6	8.6	13.5	61.6	7.2	53.1	27.4	2	silt
8C1a	6G1a	6C1a	ORGANIC MATTER			Bulk Density					4A	4B2
pH 1:1	KCl- Ext. mg/100g	Iron as Fe %	6A1a ORGANIC CARBON %	6B1a NITRO- GEN %	C/N	Field Moist		30 Cm.		A.D.	D _t ² g/cc e	15-Bar Water %
						4B4 % M.	4A1a g/cc	4B3 % M.	4A1c g/cc	4A1b g/cc		
5.7d	-	0.8	15.4	1.13	14	40.7	0.78			0.92	0.6	37.5
5.2	0.1	1.0	9.81	0.568	17	32.4	0.90			0.97	0.7	19.7
5.0	1.1	0.9	2.51	0.305	8							7.6
4.7	3.0	0.8	1.42	0.172	8							5.4
4.7	4.2	1.1	1.02	0.094	11	13.0	1.40	19.1	1.38	1.39	0.7	4.1
4.5	3.9	1.0	0.67									3.7
4.8	2.3	1.0	0.25									3.1
4.9	0.5	0.7	0.11									2.0
5.2	0.3	1.0	0.13									2.4
5.0		1.4	0.28									
5A1a	EXTRACTABLE CATIONS 5B1a					5C1	5C3 Ratios to Clay		8D1	Carbonate as CaCO ₃		
CATION EXCHANGE CAPACITY NH ₄ OAc	6N2b	6O2b	6H1a	6P2a	6Q2a	Base Sat. % NH ₄ OAc Exch.	Base Sat. % on Sum Cations	15- Atm. Moist.	Cat. Exch. Cap.	Iron	Whole Sample %	Clay- Size %
	Co	Mg	H	Na	K	milliequivalents per 100g. soil						
39.0	27.6	7.0	26.4	0.1	1.3	92	58					
30.1	14.8	4.4	26.3	0.1	0.4	65	43	1.68	2.57	.08		
16.4	5.0	2.1	16.5	0.1	0.2	45	31	0.84	1.80	.10		
12.2	2.7	1.5	13.4	Tr.	0.1	35	24	1.06	2.39	.16		
11.5	1.8	0.9	13.0	0.1	0.1	25	18	0.98	2.74	.26		
11.5	1.9	1.0	11.6	0.1	0.1	27	21	0.88	2.74	.24		
8.9	2.2	1.1	7.2	0.1	0.1	39	33	0.78	2.22	.25		
5.2	1.8	1.0	3.0	0.3	0.1	62	52	1.05	2.74	.37		
7.6	3.9	1.7	3.5	0.1	0.1	76	62	0.63	2.00	.26		

- a. No PSD due to high organic matter content.
- b. Few mica flakes.
- c. Silt sample from horizon IIIC2 (Laboratory No. 15794).
- d. 1:5 soil-water ratio due to high organic matter content.
- e. Weight of fine earth per unit volume of horizon, calculated for 30-cm. bulk density where available; otherwise field-moist bulk density.

Soil type: Ptarmigan stony loam

Soil No.: S61Wyo-15-1

Location: Park County, Wyoming; Deep Lake Quadrangle USGS, 15 min. series, topographic; 200 feet east of benchmark, elevation 10,536 feet, Cooke City Highway; the benchmark is one-half mile north of Gardner Lake near Gardner Headwall on the highway; pit is across the highway (north), 250 feet off highway at east end of highway embankment and 500 feet southeast of small lake. The area is unsurveyed.

Exposure: 260 degree west-facing; slope 20 percent up east, 25 percent down west.

Physiography: Beartooth Plateau; stony hilly upland; lower three-fourths part of slope above a small lake.

Parent material: Schist with perhaps some diorite and quartzite.

Stoniness: Mainly sharp angular coarse fragments; 20 percent cobbles and stones; 30 percent gravels.

Vegetation: Surface has 75 percent turf, 20 percent rock, and 5 percent bare soil; dry avens and sedge.

Drainage: Medium to rapid. Climate: Cold, subhumid.

Temperatures: 60 degrees F. on ground surface at 3:20 P.M.; 34.75 degrees F. at 90 inches depth at 5:00 P.M.

Collected by: R. C. McConnell, T. J. Nimlos, R. Taber, and C. A. Mogen, August 23, 1961.

Horizon and
Lincoln Lab.No.

- O
15750 2 to 0 inches. Very dark grayish brown (10YR 3/2) gravelly silt loam, 10YR 2/2 moist; moderate fine crumb; soft, very friable; abundant roots; estimated 20 percent by volume occupied by fine hair roots; 50 percent humus and plant remains, and 30 percent mineral matter; estimated 65 percent pore space; clear smooth boundary.
- All
15751 0 to 2 inches. Very dark grayish brown (10YR 3/2) gravelly silt loam, 10YR 2/2 moist; 25 percent subangular gravels; weak very fine granular; soft, very friable, slightly sticky and slightly plastic; abundant roots; very porous; estimated 40 percent pore space but without distinct pores; gradual lower boundary; abundant clear uncoated fine sand grains of mica and quartz.
- A12
15752 2 to 9 inches. Very dark grayish brown (10YR 3/2) very gravelly loam, 10YR 2/2 moist; 50 percent coarse fragments of which 10 percent are cobbles, 10 percent coarse gravels, and 30 percent gravel less than 3/4-inch diameter; weak very fine granules; soft, very friable, slightly sticky and nonplastic; common clear uncoated fine sand grains of mica and quartz; abundant roots; very porous (est. 50 percent pore space) without distinct pores; gravel and cobble stained on underside, 7.5YR 2/4, generally concentrated around the outside edge with diffused inner boundary staining to 2.5YR 4/4; roots matted around gravel and cobbles; a few rocks on end, the remainder parallel with land surface; clear wavy boundary.
- B21r
15753 9 to 13 inches. Brown (7.5YR 4/4) very gravelly loam, 5YR 3/4 moist; 60 percent subangular coarse fragments including 20 percent fine gravel, 15 percent coarse gravel, 25 percent cobbles, and a few stones; weak very fine granular; soft, very friable, slightly sticky and nonplastic; abundant roots matting around gravel and cobble; very porous (est. 50 percent) without distinct pores; gravels stained 2.5YR 2/2 and staining the outer edges of underside of cobbles and large gravels; few fine iron concretions that crush black and red; few elongated cobbles are on end, the rest lay parallel with land surface; clear irregular boundary.
- B22r
15754 13 to 25 inches. Yellowish brown (10YR 5/4) very gravelly loam, 7.5YR 4/4 moist; 50 percent subangular coarse fragments including about 15 percent cobble and stone; moderate fine platy; soft, friable, slightly sticky and nonplastic; plentiful roots, well distributed; many very fine pores, 30 percent pore space; gravel and cobbles stained 2.5YR 2/2 concentrated on outer edge of undersides of large gravel and cobbles and coating smaller gravel; few rocks on end, but most of the elongated fragments lay mainly parallel with land surface; diffuse lower boundary.
- B23r
15755 25 to 34 inches. Yellowish brown (10YR 5/4) cobbly gravelly loam, 7.5YR 4/4 moist; 60 percent coarse fragments including 25 percent cobbles and stones; moderate fine platy; soft, friable, slightly sticky and nonplastic; plentiful roots, well distributed, not matted; many very fine pores, 30 percent pore space; gravel and cobbles stained on underside and generally concentrated on outer edge of larger gravel and cobbles; few rocks on end, but most elongated or flattish fragments lay parallel with land surface; 1/8-inch thick accumulation of silt and very fine sand on tops of cobbles and stones; clear irregular boundary.
- B24r
15756 34 to 45 inches. Yellowish brown (10YR 5/4) very cobbly sandy loam, 7.5YR 4/4 moist; 75 percent coarse fragments including 35 percent cobbles and stones; very weak medium platy; soft, very friable, nonsticky and nonplastic; plentiful roots, well distributed, not matted, but some concentrations; common very fine pores, 30 percent pore space; dark staining on undersides of all of the gravel with concentration in 2- to 4-inch wide rim on outer edge of cobbles and stones; few flattish rocks on end, but most lay parallel with land surface; 1/8-inch thick accumulation of silt and very fine sand on tops of cobbles and stones; thin layer of clear sand underneath about 1/8-inch thick; clear irregular boundary.
- IIc1
15757 45 to 54 inches. Light yellowish brown (10YR 6/4) stony gravelly sand, 7.5YR 5/4 moist; 85 percent coarse fragments including 50 percent cobbles and stones; single grain; loose; few roots; no root mats; decreased staining in lower part compared with B24r; 1/8-inch thick accumulation of silt and very fine sand on tops of cobbles and stones; no clear sand under stones as in above horizon; clear irregular boundary.
- IIIC2
15758 54 to 76 inches. Brown (10YR 5/3) very stony sandy loam, 10YR 4/3 moist; 85 percent coarse fragments including 50 percent cobbles and stones; massive; slightly hard, very friable, nonsticky and nonplastic; few roots; common very fine pores; no apparent staining; accumulation of silt up to 1/4-inch thick on tops of cobbles and stones; up to 1/4-inch thick layer of clear sand under rock. (Silt sampled separately, Lab. No. 15794)

MICROMORPHOLOGY:

Thin Sections: (Method 4E1) - The matrix of the O horizon is loosely packed, brown, organic aggregates less than 1-mm. in size that give the soil a micro-crumb structure. Most of the organic particles in the aggregates are decomposed beyond recognition. Mineral silt grains are contained within the aggregates and rock fragments and sand grains are incorporated in the matrix. Plant roots penetrate the matrix in random fashion. The All horizon resembles the O horizon except that it has fewer rootlets and the organic aggregates are finer. The B22r horizon has a very weak, very fine platy structure and contains some birefringent clay aggregates. Fine platy, micaceous-like particles either coat ped faces and coarse fragments or are segregated into small pockets. These particles show preferred orientation and probably account for the clay films described in the field. Most rock fragments and primary minerals in the thin sections are relatively fresh, although some weathering is apparent in the A and B horizons. Amphiboles and platy minerals are weathered along fractures and cleavage lines, and brown stains in these areas suggest that iron is being released. Grain Studies: (Method 7E1) - Quartz and feldspar dominate the vfs. Fresh glass shards (volcanic ash) comprise 10 to 15 percent of surface horizon and decrease with depth. Hornblende and a platy chloritic mineral are accessory (<10%) in the solum but dominate the nonconforming layers, II or III in the description. The term "chloritic" designates platy grains ranging from green to yellowish green that are mostly isotropic when lying flat, but some show slight birefringence along the edges. Some of these are probably biotite and a few may be vermiculite. All minerals are relatively fresh. Iron coatings are present on some grains in the B horizon and a few of the glass shards are weathered.

SOIL TYPE Ptarmigan stony loam LOCATION Park County, Wyoming

SOIL NOS. S61Wyo-15-2 LAB. NOS. 15759-15765

DEPTH INCHES	HORIZON	1B1a PARTICLE SIZE DISTRIBUTION (in mm.) (per cent) 3A1										TEXTURAL CLASS	
		VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY					2A2
		2-7	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		
0-1 1/2	A11	18.6	8.7	4.2	9.3a	6.8a	37.0	15.4	27.7	21.1	38	1	
1 1/2-5	A12	17.0	10.8	5.0	10.3a	6.9a	35.1	14.9	28.6	18.9	39	1	
5-10	A13	14.9	11.3	5.6	11.6a	8.4a	37.1	11.3	33.6	18.0	31	1/cos1	
10-18	B21ir	11.4	11.3	6.5	13.8a	9.3a	38.1	9.6	35.3	19.3	24	cos1/1	
18-26	B22ir	11.8	12.6	7.3	14.0a	9.2a	34.2	10.9	34.0	16.6	21	sl/cos1	
26-42	B23t	6.3	10.8	7.6	15.7a	11.0a	36.4	12.2	37.6	17.8	17	1/fsl	
42-70	IIC	14.6	26.7	10.9	19.6a	10.5a	13.2	4.5	28.1	5.7	20	lcos	
8C1a	6G1a	6C1a ORGANIC MATTER				Bulk Density					4A	4B2	
pH 1:1	KCL-Ext. me/100g	Iron as Fe %	6A1a ORGANIC CARBON % C	6B1a NITRO-GEN %	C/N	Field Moist		30 Cm.		A.D.	In ² g/cc d	15-Bar Water %	
						4B4 % M.	4A1a g/cc	4B3 % M.	4A1c g/cc	4A1b g/cc			
4.9b	0.6	1.0	8.34	0.763	11	28.5	0.76			0.86	0.5	23.2	
4.8	4.3	1.0	5.37	0.439	12	20.8	0.98			1.04	0.7	12.4	
5.0	3.8	1.0	1.84	0.139	13							6.8	
4.9	2.4	0.9	0.61	0.060	10	7.4	1.57	17.1	1.52	1.55	1.0	6.0	
4.8	1.0	0.9	0.38	0.032	12							5.8	
5.2	0.3	1.0	0.22			7.6	1.65	15.8	1.60	1.64	1.0	6.5	
6.8	-	0.9	0.05									4.5	
5A1a	6N2b EXTRACTABLE CATIONS 5B1a					5C1	5C3	6D1 Ratios to Clay			Carbonate as CaCO ₃		
CATION EXCHANGE CAPACITY NH ₄ OAc	Co	Mg	H	No	K	Base Sat. % NH ₄ OAc Exch.	Base Sat. % on Sum Cations	15-Atm. Moist	Cat. Exch. Cap.	Iron	Whole Sample	Clay Size	
											milliequivalents per 100g. soil		%
28.4	12.3	2.7	27.3	0.2	0.5	55	36	1.51	1.84	.06			
23.6	4.1	0.9	29.9	0.1	0.1	22	15	0.83	1.58	.07			
16.0	4.3	0.7	17.5	0.1	0.1	32	23	0.60	1.42	.09			
14.5	6.4	0.8	10.7	0.1	0.1	51	41	0.62	1.51	.09			
14.9	8.9	1.4	8.2	0.1	0.1	70	56	0.53	1.37	.08			
16.3	12.9	1.9	3.4	0.2	0.1	93	82	0.53	1.34	.08			
13.2	12.8	1.6	3.7	0.1	0.1	111	80	1.00	2.93	.20			

- a. Few mica flakes.
- b. 1:5 soil-water ratio due to high organic matter content.
- c. 15 Kg/M² organic carbon to 60 inches.
- d. Weight of fine earth per unit volume of horizon, calculated for 30-cm. bulk density where available; otherwise field-moist bulk density.

Soil type: Ptarmigan stony loam

Soil No.: S61Wyo-15-2

Location: Park County, Wyoming; Deep Lake Quadrangle USGS, 15 min. series, topographic; 2,640 feet north of benchmark, elevation 10,536 feet, Cooke City Highway. The benchmark is one-half mile north of Gardner Lake near Gardner Headwall on the highway; pit is north-northwest of Gardner Headwall about 3/8-mile north of highway at lower loup incline up the north face of Gardner Headwall; 130 degree compass direction east-southeast about 3/4-mile to site of Profile S61Wyo-15-1, Ptarmigan series. The area is unsurveyed.

Exposure: 40 degrees compass northeast-facing.

Slope: 9 percent slightly convex up south, 20 percent convex down north.

Physiography: Beartooth Plateau, stony hilly upland near north end of stony ridge extending as an undulating rock terrace north from the Gardner Headwall to overlooking a U-shaped alpine marsh valley on the north and a rocky canyon on the west-southwest.

Parent material: Granite-schist and some high mica.

Stoniness: Estimated 10 percent stones and 20 percent fine gravel on surface at sample site; stoniness ranges up to 100 percent angular flags and stones in narrow bands, 1 to 2 feet across, of rock polygons occurring in the vicinity.

Vegetation: Avens and some hairgrass.

Drainage: Medium to rapid runoff; medium rate of internal drainage.

Climate: Cold, subhumid.

Temperature at 5:00 P.M. on August 21, 1961: 54 degrees F. at surface, 53 at 1 inch, 50 at 6, 48½ at 12, 47½ at 28, 47 at 40, and 38 degrees F. at 68 inches.

Remarks: The south side of pit is in an old rock rubble strip (rock polygon rim) with 95 percent angular cobbles and stones below the surface 10 inches; cobbles and stones are mainly oriented vertically. John Hetzer (Forest Service) stated that the fine and very fine angular gravel (rotten rock) occurring at 42 to 70 inches is of common occurrence above the permanently frozen zone in alpine soils. Permanently frozen ground was not found at this site, examined to a depth of 86 inches.

Collected by: R. C. McConnell, T. J. Nimlos, R. Taber, and C. A. Mogen, August 23, 1961.

Horizon and
Lincoln Lab.No.

- All
15759 0 to 1½ inches. Dark gray (10YR 4/1) stony fine gravelly loam, 10YR 2/2 moist; moderate medium crumb structure; soft, very friable, slightly sticky and slightly plastic; abundant roots; 15 percent material volume occupied by fine hair roots; estimated 65 percent pore space without distinct pores; abundant light-colored clean sand grains; clear smooth boundary.
- A12
15760 1½ to 5 inches. Dark grayish brown (10YR 4/2) stony fine gravelly loam, 10YR 2/2 moist; weak medium crumb structure; soft, very friable, slightly sticky and slightly plastic; abundant roots; very porous; estimated 50 percent pore space but without distinct pores; abundant clear fine and very fine sand grains; gravel has 7.5YR 2/2 coating on undersides in small concavities; gradual boundary.
- A13
15761 5 to 10 inches. Grayish brown (10YR 5/2) stony fine gravelly loam, 10YR 3/3 moist; 25 percent coarse fragments of which 20 percent is fine gravel; strong very fine subangular blocky structure and medium granular structure; soft, very friable, slightly sticky and slightly plastic; abundant roots; very porous without distinct pores; estimated 50 percent pore space; common large (1/2- to 1-inch diameter) 7.5YR 2/2 stains on undersides of gravel and cobbles; roots matted around gravel and cobbles; clear slightly wavy boundary.
- B21r
15762 10 to 18 inches. Brown (10YR 5/3) stony fine gravelly loam, 10YR 3/4 moist; 35 percent coarse fragments of which 25 percent is gravel; strong fine and very fine subangular blocky structure arranged in moderate medium plates; soft, very friable, slightly sticky and slightly plastic; plentiful roots with some matting around gravel and stones; porous, many fine vertical pores; 30 percent pore space; gravel and cobbles stained 7.5YR 2/2 on undersides; gradual boundary.
- B22r
15763 18 to 26 inches. Pale brown (10YR 6/3) stony fine gravelly loam, 10YR 4/3 moist; 35 percent coarse fragments including 15 percent cobbles and stones; strong fine and very fine subangular blocky structure arranged in moderate medium plates; soft, very friable, slightly sticky and slightly plastic; plentiful roots with some matting around cobbles and stones; porous, many fine vertical pores; 30 percent pore space; weakly stained; tops and sides completely coated with silt; 1/32- to 1/4-inch layer clear clean sand grains in soil cast beneath the rocks; clear wavy boundary.
- B23t
15764 26 to 42 inches. Yellowish brown (10YR 5.3/4) stony fine gravelly sandy clay loam, 10YR 3/4 moist; 35 percent coarse fragments including 15 percent cobbles and stones; moderate medium and large angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few roots; some root concentrations in mats; abundant fine pores; fine and medium vesicles; 30 percent pore space; moderately thick clay films on walls of vesicles and pores; patches of clear sand grains, a few grains thick on horizontal surfaces; many fine and very fine (granular-size) black stains on all sides of yellowish colored rock; all of the elongated rocks are on end; abrupt very irregular boundary.
- IIC
15765 42 to 70 inches. Rotten rock; mottled green and yellow.

MICROMORPHOLOGY:

Thin Sections: (Method 4E1)

The matrix of the All horizon is composed of loosely packed, brown, organic aggregates less than 1-mm. in size. These give a micro-crumb structure to the soil. Most of the organic particles in the aggregates are decomposed beyond recognition. Silt-size mineral grains are contained within the aggregates and rock fragments and sand-size mineral grains are incorporated within the matrix. Plant roots penetrate the matrix in seemingly random fashion.

The A12 horizon resembles the All horizon except that it has fewer rootlets and the organic aggregates are finer.

The B23t horizon has a weak, very fine platy structure and contains many birefringent clay aggregates. Fine platy, micaceous-like particles either coat ped faces and coarse fragments or are segregated into small pockets. These particles show preferred orientation and probably account for the clay films described in the field.

Most rock fragments and primary minerals in the thin sections are relatively fresh, although some weathering is apparent in the A and B horizons. Amphiboles and platy minerals are weathered along fractures and cleavage lines, and brown stains in these areas suggest that iron is being released. The "platy" minerals are described more fully below.

Grain Studies: (Method 7B1)

Quartz and feldspar are the dominant minerals throughout. Fresh glass shards (volcanic ash) comprise 10 to 15 percent of the surface horizon and decrease with depth. Hornblende and a platy chloritic mineral are accessory (< 10 percent) in the solum but dominate the nonconforming layers, II or III in the field description. "Chloritic" is used to designate platy grains ranging from green to yellowish green. When lying flat, most are isotropic; some show slight birefringence along edges; some of these are probably biotite and a few may be vermiculite. All minerals are relatively fresh. Iron coatings are present on some grains in B horizons and a few of the glass shards are weathered.

SOIL SURVEY LABORATORY

Mandan, North Dakota

9/19/55

SOIL TYPE Renohill
clay loam

LOCATION Campbell County, Wyoming

SOIL NOS. S54Wyo-3-1

LAB. NOS. 2450-2456

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 (< 0.075 mm)	> 2	
0-2	A1	3.0	4.6	6.5	16.3	15.8	28.2	25.8	39.9	13.8	2	1
2-4	B1	1.4	2.5	3.5	11.4	14.0	24.1	43.1	31.9	13.4	Tr.	c
4-9	B2t	0.9	1.4	2.0	10.4	16.8	26.3	42.0	34.9	16.1	-	c
9-15	B3ca	0.2	0.4	0.6	16.9	25.5	25.8	30.6	50.6	16.0	-	cl
15-22	C1ca	0.1	0.4	0.7	21.2	30.2	24.9	22.5	59.7	14.6	-	scl
22-29	C2ca	0.2	0.5	0.6	13.5	28.0	31.1	26.1	54.3	16.9	-	l
29-40 1/2	R	0.2	0.3	0.5	12.4	22.8	30.5	33.3	44.9	19.9	-	cl

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a	MOISTURE TENSIONS			
	8C1a	8C1a	6A1a	6B1a	C/N	ESTR. SALT (BUREAU CUP)		CaCO ₃ equiv. elem. %	GYPSUM mg./100g. SOIL	1/10	1/3	15
	1:5	1:10	%	%						ATMOS.	ATMOS.	ATMOS.
6.6	7.0	7.0	1.79	.181	9.9	-	0.5	1				9.2
6.6	7.1	7.0	1.18	.113	10.4	-	0.4	1				14.0
7.4	8.1	8.2	0.89	.091	9.8	-	0.6	2				13.7
7.8	8.2	8.4	0.60	.061	9.8	-	0.6	5				10.4
8.0	8.5	8.4	0.36			-	0.4	4				8.0
8.0	8.4	8.6	0.26			-	0.5	3				9.1
8.0	8.6	8.7	0.17			-	0.4	2				10.8

5A1a CATION EXCHANGE CAPACITY (NH ₄ Ac)	EXTRACTABLE CATIONS 5B1a					5D2 EXCH. No %	8A1 SATURATION EXTRACT SOLUBLE		8A MOISTURE AT SATURATION %
	6N2b	6O2b	6P2a				6P1a	6Q1a	
	Ca	Mg	H	Na	K		Na	K	
17.0	12.2	5.0		0.1	0.9	-	0.4	0.4	47.3
23.8	18.6	5.1		0.1	0.6	-	0.3	0.1	52.5
23.1		4.9		0.1	0.3	-	0.4	0.1	60.3
15.5				0.1	0.1	1	0.6	-	51.8
11.2				0.1	0.1	1	0.4	0.1	49.2
13.7				0.1	0.1	1	0.6	0.1	49.4
16.9				0.2	0.1	-	1.2	0.1	55.0

Soil type: Renohill clay loam
 Soil No.: S54Wyo-3-1
 Location: Campbell County, Wyoming; 700 feet south of northwest corner of Section 32, T50N, R71W.
 Physiographic position: Upland.
 Topography: Convex slope; approximately 6 percent south-facing.
 Drainage: Moderately well drained.
 Vegetation: Short grasses, largely blue grama and sage.
 Use: Pasture.
 Collected by: L. T. Alexander, James Allen, Harold Bindschadler, and A. J. Cline, August 16, 1954.
 Described by: A. J. Cline.

Horizon and
 Lincoln
 Lab. Number

A1 0 to 2 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) loam; soft, dry; very friable, moist; moderate very fine granular; noncalcareous; horizon is indefinitely platy in places; lower boundary clear and smooth.
 2450

B1 2 to 4 inches. Brown (10YR 5/3.5 dry, 10YR 4/3.5 moist) clay loam; very hard, dry; friable, moist; weak to moderate medium subangular blocky; noncalcareous; a few very indistinct and patchy clay skins visible only with hand lens; lower boundary clear and smooth.
 2451

B2t 4 to 9 inches. Dark yellowish brown (10YR 4/4 dry and moist) light silty clay; very hard, dry; firm, moist; moderate medium prismatic breaking to moderate medium angular blocky; moderately prominent clay skins; a few medium-sized distinct 10YR 5/6 mottles; noncalcareous; boundary abrupt.
 2452

B3ca 9 to 15 inches. Light olive brown (2.5Y 5.5/4 dry, 2.5Y 5/4 moist) heavy clay loam; very hard, dry; firm, moist; weak coarse prismatic breaking to weak coarse angular blocky; calcareous; a few small concretions and mycelia of calcium carbonate; many medium-sized distinct 2.5Y 5/6 mottles; horizon contains a few partially weathered shale fragments.
 2453

C1ca 15 to 22 inches. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/4 moist) heavy loam; very hard, dry; friable to firm, moist; massive; calcareous; moderate amounts of accumulated lime chiefly as lime flour but with some concretionary and myceliated forms; horizon contains partially weathered shale fragments; common medium-sized distinct 2.5Y 5/6 mottles; lower boundary gradual and smooth.
 2454

C2ca 22 to 29 inches. Light gray (2.5Y 7/2 dry) to grayish brown (2.5Y 5/2 moist) clay loam; very hard, dry; firm, moist; massive; calcareous; moderate accumulation of calcium carbonate chiefly as lime flour; common medium-sized distinct 2.5Y 5/6 mottles; many partially weathered shale fragments; lower boundary gradual and smooth.
 2455

R 29 to 40 inches plus. Olive gray (5Y 5/2 dry, 5Y 4/2 moist) clay loam; texture varies depending upon character of shale; very hard, dry; very firm, moist; generally massive but occasionally breaks to thin plate-like aggregates that are characteristic of the shale; calcareous; a horizon of weakly consolidated clay shale and interbedded siltstones and sandstones of the Fort Union formation.
 2456

SOIL SURVEY LABORATORY Mandan, North Dakota 9/19/55

SOIL TYPE Renohill LOCATION Campbell County, Wyoming
 clay loam

SOIL NOS. S54Wyo-3-2 LAB. NOS. 2457-2463

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURE CLASS
		3A1										
		1B1a	2A2				2A1		2A2		2A2	
VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY	0.2-0.02	0.02-0.002	< 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	< 0.002		< 0.075mm	
0-3	A1	1.4	1.1	1.1	8.4	16.4	34.6	37.0	38.2	19.0	2	cl
3-4 1/2	B1	1.4	0.9	0.8	6.5	16.0	33.8	40.6	35.9	19.0	1	c
4 1/2-10	B2t	0.7	0.6	0.6	5.2	15.0	34.1	43.8	30.8	22.3	Tr.	c
10-15	B3ca	0.8	0.5	0.4	4.7	14.5	36.7	42.4	30.3	21.7	-	c
15-20	C1ca	1.1	0.6	0.6	7.7	19.8	33.5	36.7	38.1	21.4	-	cl
20-34	C2ca	2.1	0.6	0.6	7.1	19.2	35.3	35.1	38.2	22.1	1	cl
34-43 1/2	R	0.2	0.3	0.5	7.0	20.7	37.1	34.2	41.6	21.8	-	cl
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMOS PER CM @ 25°C	6E1a		MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)		CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
1:5	1:10		ORGANIC CARBON %	NITROGEN %	C/N			%		%	%	%
6.7	6.9	7.0	1.91	.186	10.3	-	0.6	-				13.2
6.8	7.1	7.0	1.45	.142	10.2	-	0.6	-				15.1
7.6	8.0	8.2	1.03	.105	9.8	-	0.6	7				16.4
7.9	8.4	8.5	0.91	.106	8.6	-	0.4	6				14.3
7.9	8.5	8.5	0.77			-	0.5	12				12.5
8.0	8.5	8.6	0.62			-	0.6	5				11.7
8.2	8.7	8.8	0.66			-	0.7	5				12.1
5A1a	EXTRACTABLE CATIONS 5B1a					5D2	SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY (NH ₄ Ac)	6N2b	6O2b	6P2a		6Q2a		6P1a	6Q1a				MOISTURE AT SATURATIO
	Ca	Mg	H	Na	K	EXCH. No %	No	K				%
	← milliequivalents per 100g. soil →						← milliequivalents per liter →					
23.6	18.5	5.1		0.1	1.1	-	0.3	0.4				54.1
24.4	20.2	5.0		0.1	0.5	-	0.3	0.2				54.9
24.8				0.1	0.3	-	0.3	0.1				56.9
22.9				0.1	0.2	-	0.3	-				54.7
20.7				0.1	0.2	-	0.6	0.1				48.5
19.8				0.2	0.2	1	0.7	0.1				50.6
21.2				0.6	0.1	2	3.2	0.1				50.5

Soil type: Ranchhill clay loam

Soil No.: S54Wyo-3-2

Location: Campbell County, Wyoming; southwest quarter of northeast quarter of Section 7, T49N, R72W.

Physiographic position: Upland.

Drainage: Moderately well drained.

Topography: Convex slope approximately 7 percent facing northeast.

Vegetation: Short grasses, chiefly blue grama and scattered sage.

Use: Pasture.

Collected by: L. T. Alexander, James Allen, Harold Bindschadler, and A. J. Cline, August 16, 1954.

Described by: A. J. Cline.

Horizon and

Lincoln

Lab. Number

- A1
2457 0 to 3 inches. Light brownish gray (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2 moist) clay loam; loose, dry; very friable, moist; weak coarse platy breaking to moderate fine granular; noncalcareous; lower boundary clear and smooth.
- B1
2458 3 to 4½ inches. Grayish brown (10YR 4.5/2 dry) to dark grayish brown (10YR 3.5/2 moist) light silty clay; very hard, dry; friable, moist; weak to moderate medium subangular blocky; noncalcareous; a few very indistinct and patchy clay skins; lower boundary clear and smooth.
- B2t
2459 4½ to 10 inches. Light olive brown (2.5Y 5/3 dry) to olive brown (2.5Y 4/3 moist) silty clay; very hard, dry; very firm, moist; moderate medium prismatic breaking to moderate to strong medium angular blocky; noncalcareous; faint but distinct clay skins; abrupt smooth lower boundary.
- B3ca
2460 10 to 15 inches. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/3 moist) silty clay loam; very hard, dry; very firm, moist; moderate coarse angular blocky structure; calcareous; the horizon has a few concretions of lime; lower boundary gradual and smooth.
- C1ca
2461 15 to 20 inches. Light brownish gray (2.5Y 6/2 dry) to grayish brown (2.5Y 5/2 moist) silty clay loam; very hard, dry; very firm, moist; weak coarse subangular blocky structure; calcareous; the horizon contains much accumulated lime chiefly as lime flour but with some concretionary and myceliated forms; common medium-sized distinct 10YR 5/6 mottles; lower boundary gradual and smooth.
- C2ca
2462 20 to 34 inches. Light olive brown (2.5Y 5/3 dry) to olive brown (2.5Y 4/3 moist) silty clay loam; hard, dry; firm, moist; massive; calcareous; much accumulated lime chiefly as lime flour but with some concretionary forms; common medium-sized distinct 10YR 4/4 mottles; lower boundary gradual and smooth.
- R
2463 34 to 43 inches plus. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/3 moist) silty clay loam; hard, dry; firm, moist; massive; calcareous; common medium-sized distinct 10YR 5/6 mottles; partially weathered clay shale interbedded with siltstones and sandstones of Fort Union age.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Rosebud **LOCATION** Goshen County, Wyoming
 very fine sandy loam

SOIL NOS. 953Wyo-8-7 **LAB. NOS.** 1920-1925

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		
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				
0-2	Ap1	0.8	10.4	9.3	21.4	33.6	9.3	15.2	54.6	3.6	-	vfs1
2-8	Ap2	0.4	8.3	8.6	20.7	35.3	10.1	16.6	57.2	3.3	-	vfs1
8-12	B21t	-	3.6	5.4	20.9	37.0	8.5	24.6	58.9	2.5	-	scl
12-19	B22t	-	2.0	3.8	24.7	42.9	9.6	17.0	68.7	4.1	-	vfs1
19-28	B3	-	2.4	4.2	27.2	43.5	9.3	13.4	71.5	3.9	-	vfs1
28-33	C	-	5.4	6.3	24.8	42.4	9.4	11.7	67.8	3.8	-	vfs1

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2	ELECTRI- CAL CONDUCT- IVITY EC x 10 ³ MILLIMHOS PER CM	6E1a	6F1a	MOISTURE TENSIONS		
	8C1a	8C1a	6A1a			EST% SALT (BUREAU CUP)	CaCO ₃ equiv- alent	GYPSUM mg./100g. SOIL	4B1a	4B1a	4B2	
	1:5	1:10	ORGANIC CARBON	NITRO- GEN	C/N		%	%	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
			%	%			%	%	%	%	%	
5.8	6.9	7.1	0.72			<0.20	0.6	-	23.5	14.6	7.1	
6.6	6.9	7.1	0.72			<0.20	0.4	-	30.4	17.3	7.7	
6.6	7.0	7.2	0.54			<0.20	0.4	-	36.9	23.9	11.9	
6.6	6.7	6.9	0.26			<0.20	0.4	-	24.0	15.4	8.5	
6.8	6.8	7.0	0.16			<0.20	0.4	-	24.1	13.0	7.0	
6.9	6.9	7.0	0.13			<0.20	0.4	-	22.7	13.0	6.5	

5A1a	5B1a	CATIONS		5B1b	5D2	8A1 SATURATION EXTRACT SOLUBLE		8A	
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE		EXCH. No %	6P1a	6Q1a	MOISTURE AT SATU- RATION %	
	6N2b Ca	6O2b Mg	H	6P2a Na		6Q2a K	Na		K
← milliequivalents per 100g. soil →					← milliequivalents per liter →				
15.4	11.4	2.8		0.2	1.2	1	0.6	1.0	33.6
15.3	11.6	2.8		0.2	0.9	1	0.6	0.4	33.7
21.9	17.2	4.2		0.4	1.2	2	0.6	0.4	46.1
18.5	16.2	3.7		0.2	0.8	1	0.6	0.4	39.7
16.4	12.6	2.9		0.2	0.8	1	0.6	0.4	35.5
15.6	12.4	2.6		0.2	0.8	1	0.6	0.4	33.4

Soil type: Rosebud very fine sandy loam

Soil No.: S53Wyo-8-7

Location: Goshen County, Wyoming; 900 feet south of northwest corner of the southeast quarter of Section 36, T21N, R64W; 200 feet east of road; photo 5-75.

Vegetation: Cultivated; wheat stubble.

Slope: 4 percent upland; slightly convex, faces south; well drained.

Parent material: Eolian sands over calcareous Miocene sandstone.

Described by: C. J. Fox, September 28, 1953.

Horizon and
Mandan

Lab. Number

- Ap1 0 to 2 inches. Dark grayish brown (10YR 4/2.5 dry) or very dark grayish brown (10YR 3/2 moist) non-calcareous friable very fine sandy loam; weak fine granular and single grain structure; abrupt wavy boundary.
1920
- Ap2 2 to 8 inches. Dark grayish brown (10YR 4/2 dry) noncalcareous friable loam; extremely hard when dry; roots plentiful; removes in hard angular fragments; abrupt smooth boundary.
1921
- B21t 8 to 12 inches. Dark brown (10YR 4/3 dry) or very dark grayish brown (10YR 3/2 moist) noncalcareous fine and medium strongly developed prismatic angular blocky sandy clay loam that crushes to fine moderately developed granules; plastic when wet, extremely hard when dry; roots abundant; clear smooth boundary.
1922
- B22t 12 to 19 inches. Yellowish brown (10YR 5.5/4 dry) or brown (10YR 4/3 moist) noncalcareous coarse and medium weakly prismatic heavy fine sandy loam; prisms are thinly coated a darker color and break to medium moderately developed blocks that crush to very fine weak granules and single grains; blocky units moderately porous; friable when moist, extremely hard when dry; many old root channels and some fine roots; gradual wavy boundary.
1923
- B3 19 to 28 inches. Light yellowish brown (10YR 6/4 dry) or brown (10YR 4.5/3 moist) noncalcareous friable coarse weak prismatic angular blocky fine sandy loam that crushes to single grains and very fine weak granules; hard when dry; a few fine roots and old root channels filled with dark brown material; gradual wavy boundary.
1924
- C 28 to 33 inches. Pale brown (10YR 6/3 dry) or dark brown (10YR 4/3 moist) noncalcareous friable light fine sandy loam that removes in angular pieces that crush to single grains; extremely hard when dry; abrupt irregular boundary.
1925
- Dr 33 to 45 inches plus. (Not sampled.) Sandstone of the Arikaree formation (Miocene).

SOIL TYPE Rosebud LOCATION Goshen County, Wyoming
 very fine sandy loam

SOIL NOS. 854Wy-8-2 LAB. NOS. 2526-2531

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	
0-2	A1	1.0a	5.1	5.6	23.9	40.4	12.3	11.7	66.0	5.4	—	vfs1
2-6	B1	0.7a	3.0	2.7	11.8	34.4	14.8	32.6	52.5	6.1	—	scl
6-11	B21t	0.3a	2.6	2.4	7.8	31.9	25.1	29.9	53.2	10.2	—	scl
11-16	B22t	0.2a	2.4	2.4	7.3	34.0	30.6	23.1	59.2	11.3	—	l
16-21	B3	0.1a	2.0	2.1	6.6	35.0	35.1	19.1	61.2	14.3	—	l
21-23	Clca	0.5	4.4	4.3	9.3	33.9	31.0	16.6	58.4	13.4	—	vfs1

8C1b SATURATED PASTE	pH 8C1a	ORGANIC MATTER				8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMOS PER CM	6E1a		MOISTURE TENSIONS		
		8C1a	6A1a	6B1a	CoCO ₂ equiv- alent			GYPSUM ma./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
		1:5	1:10	ORGANIC CARBON %								NITROGEN %
6.4	7.1	7.1	1.33	.104	12.8	—	—	—	—	—	—	5.4
6.8	7.7	7.6	1.16	.101	11.5	—	—	—	—	—	—	13.1
7.1	8.0	8.0	0.75	.072	10.4	—	—	—	—	—	—	13.0
7.2	8.3	8.2	0.55	.061	9.0	—	—	—	—	—	—	10.2
7.6	8.6	8.6	0.43	.054	8.0	—	—	—	—	—	—	9.0
8.0	9.0	9.2	0.37			—	— ^b					8.9

5A1a CATION EXCHANGE CAPACITY ← NH ₄ ⁺ C	EXTRACTABLE CATIONS					5B1a BASE SAT. %	SATURATION EXTRACT SOLUBLE			MOISTURE AT SATURATION %
	6N2b	6O2b	6P2a		6Q2a		Na	K		
	Ca	Mg	H	Na	K					
10.9	7.1	2.1		0.1	0.8					
24.7	17.5	5.2		0.1	1.8					
24.9	17.9	5.5		0.2	2.0					
21.8	15.5	5.2		0.2	1.7					
21.6	16.6	5.5		0.3	1.9					
18.0		5.5		0.2	1.9					

a. Organic matter in sand fractions.
 b. Re-examination of site by Arvad Cline and extractable calcium datum both indicate carbonates present.

Soil type: Rosebud very fine sandy loam

Soil No.: 854Wyo-8-2

Location: Goshen County, Wyoming; approximately 85 feet north and 50 feet east of southwest corner of Section 31, T19N, R63W.

Physiographic position: Upland.

Topography: Gentle convex slope approximately 3 percent facing east.

Drainage: Well drained.

Use: Pasture.

Vegetation: Chiefly short grasses, blue grama, buffalograss with some western wheatgrass.

Collected by: James Allen, Charles Fox, E. F. Brunkow, and A. J. Cline, August 30, 1954.

Described by: A. J. Cline.

Horizon and

Lincoln

Lab. Number

- A1
2526 0 to 2 inches. Grayish brown (10YR 5/2 dry) to very dark grayish brown (10YR 3/2 moist) fine sandy loam; soft when dry, very friable when moist; very weak fine platy to weak fine crumb structure; platiness is not uniform and degree of its expression varies from place to place; noncalcareous; lower boundary clear and smooth.
- B1
2527 2 to 6 inches. Brown (7.5YR 5/3 dry) to dark brown (7.5YR 4/2 moist) light clay loam; very hard when dry, firm when moist; moderate medium columnar breaking to moderate medium subangular blocky; the tops of the columns are slightly rounded and aggregate faces are flecked with 10YR 8/2 materials; noncalcareous; lower boundary clear and smooth.
- B2t
2528 6 to 11 inches. Brown (10YR 5/3 dry) to dark brown (10YR 3/3 moist) heavy silty clay loam; very hard when dry and very firm when moist; strong medium prismatic breaking to strong medium angular blocky; moderately thick and relatively prominent clay skins; noncalcareous; lower boundary gradational and wavy.
- B2t
2529 11 to 16 inches. Brown (10YR 5/3.5 dry) to 10YR 4/3.5 moist light clay loam; hard when dry and friable when moist; moderate coarse prismatic to moderate coarse subangular blocky; there are a few thin patchy clay skins; noncalcareous; lower boundary clear and smooth.
- B3
2530 16 to 21 inches. Pale brown (10YR 6/3.5 dry) to brown (10YR 5/3.5 moist) light fine sandy clay loam; hard when dry, friable when moist; weak coarse subangular blocky structure; noncalcareous; lower boundary abrupt and smooth.
- Clca
2531 21 to 23 inches. Very pale brown (10YR 8/3 dry) to pale brown (10YR 6/3 moist) very fine sandy loam; hard when dry, friable when moist; massive; calcareous; horizon contains moderate amounts of accumulated lime chiefly as lime flour but with a few calcium carbonate concretions; the horizon rests abruptly on hard bedrock of the Arikaree formation.

SOIL SURVEY LABORATORY

Mandan, North Dakota

9-8-55

SOIL TYPE

Rosebud

LOCATION

Goshen County, Wyoming

loamy very fine sand

SOIL NOS.

954Wyo-8-3

LAB. NOS.

2532-2538

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 ($< 19\mu$)
0-3	A1	1.3 a	4.8	6.4	25.0	43.4	12.0	7.1	71.6	5.4	-	lfs	
3-6 1/2	B1	1.1 a	4.3	5.1	25.0	42.5	9.8	12.2	70.3	4.1	-	vfsl	
6 1/2-13	B21t	0.3 a	0.7	1.0	10.1	37.9	24.8	25.1	62.4	9.4	-	scl	
13-17	B22t	0.2 a	0.5	0.6	8.9	41.7	29.0	19.1	67.8	11.2	-	l	
17-21	B3ca	0.3	0.9	1.1	15.5	46.8	21.2	14.2	73.7	7.9	-	vfsl	
21-30	C1ca	0.2	0.4	0.6	16.9	47.0	24.0	10.9	76.4	10.6	-	vfsl	
30-41	C2ca	0.2	0.9	1.2	22.9	50.0	14.5	10.3	80.1	5.9	-	vfsl	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY		6E1a		MOISTURE TENSIONS		
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMOS PER CM @ 25°C.	CaCO ₃ equiv-ent %	GYP SUM mg./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %	
6.6	7.2	7.2	1.28	.105	12.2	-	-	-	-	-	-	4.9	
6.8	7.3	7.4	1.12	.100	11.2	-	-	-	-	-	-	6.3	
7.2	8.0	8.0	0.88	.085	10.4	-	-	-	-	-	-	11.5	
7.4	8.2	8.3	0.57	.063	9.0	-	-	-	-	-	-	9.0	
7.7	8.5	8.8	0.50	.055	9.1	-	-	-	-	-	-	7.0	
8.2	9.0	9.1	0.31	-	-	-	-	8	-	-	-	7.8	
8.1	9.0	9.2	0.20	-	-	-	-	5	-	-	-	5.7	
5A1a CATION EXCHANGE CAPACITY (NH ₄ CL)	EXTRACTABLE CATIONS 5B1a					BASE SAT. %	SATURATION EXTRACT SOLUBLE					MOISTURE AT SATURATION %	
	6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K		No	K					
	milliequivalents per 100g. soil						milliequivalents per liter						
9.7	7.1	1.6		0.2	0.8								
13.8	10.7	2.1		0.2	1.2								
23.5	19.1	3.8		0.1	1.4								
20.9	16.9	3.6		0.1	1.2								
17.0		3.1		0.1	1.1								
13.6				0.1	1.1								
11.9				0.1	1.1								

a. Organic matter in sand fraction.

Soil type: Rosebud loamy very fine sand

Soil No.: S54Wyo-8-3

Location: Goshen County, Wyoming; near southeast corner of southwest quarter of Section 35, T19N, R64W.

Physiographic position: Upland.

Topography: Gentle convex slope approximately 2 percent facing east.

Drainage: Well drained.

Vegetation: Predominantly short grasses, blue grama, buffalograss with some western wheatgrass.

Use: Pasture.

Collected by: James Allen, Charles Fox, E. F. Brunkow, and A. J. Cline, August 30, 1954.

Described by: A. J. Cline.

Horizon and

Lincoln

Lab. Number

- A1
2532 0 to 3 inches. Light brownish gray (10YR 6/2 dry) to very dark grayish brown (10YR 3/2 moist) fine sandy loam; soft when dry and very friable when moist; weak fine crumb structure; noncalcareous; lower boundary clear and smooth.
- B1
2533 3 to 6 $\frac{1}{2}$ inches. Dark brown to brown (7.5YR 4/3 dry) to dark brown (7.5YR 3/2 moist) heavy loam or light clay loam; hard when dry, friable when moist; moderate coarse subangular blocky structure; this horizon has a very weak tendency towards columnar structure; noncalcareous; lower boundary clear and smooth.
- B21t
2534 6 $\frac{1}{2}$ to 13 inches. Dark grayish brown (10YR 4/2.5 dry) to very dark grayish brown (10YR 3/2.5 moist) clay loam; very hard when dry and firm when moist; moderate medium prismatic breaking to strong medium angular blocky; noncalcareous; moderately thick well-defined clay skins; lower boundary clear and smooth.
- B22t
2535 13 to 17 inches. Very pale brown (10YR 7/3 dry) to brown (10YR 5/3 moist) heavy very fine sandy loam or loam; slightly hard when dry, friable when moist; moderate coarse prismatic breaking to moderate coarse subangular blocky; noncalcareous; a few thin patchy clay skins; lower boundary clear and smooth.
- B3ca
2536 17 to 21 inches. Very pale brown (10YR 7/3.5 dry) to pale brown (10YR 6/3 moist) fine sandy loam; slightly hard when dry, friable when moist; weak coarse subangular blocky structure; calcareous; the horizon has a few small calcium carbonate concretions; lower boundary abrupt and smooth.
- C1ca
2537 21 to 30 inches. Very pale brown (10YR 8/3 dry) to 10 YR 7/3 moist fine sandy loam; slightly hard when dry, friable when moist; massive; calcareous; the horizon contains large amounts of accumulated lime principally as lime flour but with a few concretions; lower boundary is gradual and smooth.
- C2ca
2538 30 to 41 inches. Very pale brown (10YR 8/3 dry) to 10YR 7/3 moist light fine sandy loam; slightly hard when dry, friable when moist; massive; calcareous; the horizon contains moderate amounts of calcium carbonate chiefly as lime flour but with an occasional calcium carbonate concretion; this horizon grades downward to soft sandstones.

SOIL TYPE Stoneham LOCATION Goshen County, Wyoming
 very fine sandy loam

SOIL NOS. S54Wyo-8-1 LAB. NOS. 2520-2525

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)			
0-2	A1	0.6a	1.2a	0.8	10.2	57.5	18.1	11.6	77.2	5.8	--	vfsl
2-5	B1	0.3a	0.8a	1.1	10.9	57.8	14.3	14.8	75.4	4.6	--	vfsl
5-9 1/2	B2t	0.3a	0.6	2.0	17.4	46.5	12.4	20.8	65.9	5.2	--	scl
9 1/2-13 1/2	B3	0.1a	0.5	3.0	23.4	36.4	17.3	19.3	60.5	8.4	--	vfsl
13 1/2-34	C1ca	-	0.4	3.0	21.9	39.7	17.7	17.3	63.7	8.2	--	vfsl
34-55	C2ca	-	0.3	1.2	13.0	47.0	22.2	16.3	70.6	8.7	--	vfsl
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMOS PER CM	6E1a		MOISTURE TENSIONS		4B2
8C1b SATURATED PASTE	8C1a 1:5	8C1a 1:10	6A1a ORGANIC CARBON %	6B1a NITROGEN %	C/N	EST% SALT (BUREAU CUP)		CoCO ₃ equivalent %	GYPSUM me./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %
7.9	8.0	8.1	1.01	.098	10.3	--		--				7.0
7.8	8.0	7.9	0.99	.088	11.2	--		--				7.7
7.8	8.5	8.8	0.93	.086	10.8	--		1				10.6
8.0	8.9	9.2	0.51	.052	9.8	--		8				10.0
8.0	9.1	9.2	0.26			--		7				9.1
8.1	9.5	9.5	0.09			--		5				8.3
5A1a CATION EXCHANGE CAPACITY NH ₄ Ac		EXTRACTABLE CATIONS 5B1a				BASE SAT. %	SATURATION EXTRACT SOLUBLE				MOISTURE AT SATURATION %	
		6N2b Ca	6O2b Mg	H	6P2a Na	6Q2a K	Na	K				
		← milliequivalents per 100g. soil →					← milliequivalents per liter →					
17.3			1.9		0.2	1.4						
19.7	17.6		2.0		0.2	1.3						
25.0					0.2	1.5						
21.3					0.2	1.5						
20.8					0.3	2.1						
22.2					1.4	3.2						

a. Organic matter in sand fractions.

33

Soil type: Stoneham very fine sandy loam
 Soil No.: S54Wyo-8-1
 Location: Goshen County, Wyoming; 800 feet east and 60 feet south of road junction in northwest corner of northeast quarter of section, 127N, R61W.

Physiographic position: Upland.

Topography: Strongly rolling area, convex slope 6 percent.

Drainage: Well drained.

Vegetation: About 80 percent ground cover, dominantly threadleaf sedge, blue grama, and scattered pricklypear.

Use: Pasture.

Described by: A. J. Cline.

Collected by: James Allen, Charles Fox, E. F. Brunkow, and A. J. Cline, August 30, 1954.

Horizon and

Lincoln Lab. No.

- A1
2520 0 to 2 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) very fine sandy loam; loose when dry and very friable when moist; weak fine crumb structure; noncalcareous; plant roots numerous; lower boundary abrupt and smooth.
- B1
2521 2 to 5 inches. Brown (10YR 5/3 dry) to dark grayish brown (10YR 4/2 moist) fine sandy loam; soft when dry and very friable when moist; weak fine granular structure; noncalcareous; numerous plant roots; lower boundary clear and smooth.
- B2t
2522 5 to 9½ inches. Brown (10YR 5/3 dry) to dark brown (10YR 4/3 moist) light sandy clay loam; hard when dry and plastic when wet; pores few and very fine; numerous plant roots; thin but definite clay skins; moderate medium prismatic structure breaking to moderate medium angular blocky that crush to fine granular; noncalcareous; lower boundary clear and smooth.
- B3
2523 9½ to 13½ inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) light fine sandy clay loam; slightly hard when dry, slightly plastic when wet; weak coarse prismatic structure breaking to weak angular blocky; noncalcareous; few small faint brown mottles with gray rings; numerous plant roots; lower boundary gradual and irregular.
- C1ca
2524 13½ to 34 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) very fine sandy loam; slightly hard when dry, friable when moist; very weak coarse prismatic breaking to very weak coarse subangular blocky; strongly calcareous; accumulated calcium carbonate as lime flour and as concretions; several krotovinas in pit; lower boundary diffuse and smooth.
- C2ca
2525 34 to 55 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) very fine sandy loam; hard when dry, very friable when moist; massive; pores few and fine; moderately calcareous; contains less lime than horizon above.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Terry **LOCATION** Goshen County, Wyoming
 very fine sandy loam

SOIL NOS. 953Wyo-8-8 **LAB. NOS.** 1926-1931

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	A1	0.8	0.5	0.7	31.7	45.0	11.3	10.0	75.0	3.5	-	vfs1	
5-8	AB	-	0.8	0.7	34.2	42.2	9.8	12.3	73.4	2.5	-	vfs1	
8-14	B21	0.3	0.2	0.6	35.8	40.3	9.1	13.7	71.8	2.2	-	vfs1	
14-21	B22	-	0.4	0.6	37.0	43.0	8.3	10.7	74.9	2.0	-	vfs1	
21-28	B3	0.4	0.3	0.8	37.1	43.8	9.5	8.1	76.3	2.4	-	lfs	
28-42	C1	0.7	0.4	0.8	39.9	42.1	9.7	6.4	77.1	1.9	-	lfs	
8C1b		pH		ORGANIC MATTER			8A2	ELECTRI-CAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS		
SATURATED PASTE	8C1a	8C1a	6A1a	ORGANIC CARBON	NITRO-GEN	C/N	EST% SALT (BUREAU CUP)	EC x 10 ³ MILLIMHOS PER CM	CaCO ₃ equiv-alent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	%	%				8A1a	%		%	%	%
6.5	6.7	6.8	0.69				<0.20	0.4	-				4.9
6.8	7.0	7.1	0.39				<0.20	0.4	-				6.3
6.8	6.9	7.0	0.33				<0.20	0.4	-				7.0
6.9	6.8	6.9	0.24				<0.20	0.5	-	-			5.9
7.2	6.9	7.0	0.16				<0.20	0.4	-	-			5.0
7.7	8.2	8.3	0.10				<0.20	0.5	-	-			4.5
5A1a	5B1a	CATIONS				5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE	EXCHANGEABLE		EXCHANGEABLE		EXCH. Na %	6P1a	6Q1a			MOISTURE AT SATURATION		
	6N2b	6O2b	H	6P2a	6Q2a		Na	K			%		
	Ca	Mg		Na	K		← milliequivalents per liter →						
	← milliequivalents per 100g. soil →												
10.3	6.1	2.2		0.2	1.2	2	0.3	1.0			34.5		
12.5	8.4	2.9		0.2	1.0	2	0.6	0.6			33.4		
14.2	10.0	3.4		0.2	1.0	1	0.6	0.6			33.4		
12.6	8.7	3.0		0.2	1.0	2	0.6	0.6			34.9		
11.7	8.2	2.7		0.2	1.2	2	0.6	0.6			31.0		
11.1	10.1	2.7		0.2	1.2	2	0.9	0.8			29.0		

Soil type: Terry very fine sandy loam

Soil No.: S53Wyo-8-8

Location: Goshen County, Wyoming; 0.23 mile east of northwest corner of Section 23, T29N, R61W and 75 feet south of road.

Vegetation: Permanent pasture; dominantly needle-and-thread, some sand dropseed, Indian rice grass and blue grama; about 40 percent cover.

Slope: 3 percent upland; convex, faces north; well drained.

Parent material: Eolian sands over Miocene sandstone.

Described by: C. J. Fox, September 29, 1953.

Horizon and

Mandan

Lab. Number

- A1 0 to 5 inches. Brown (10YR 5/3 dry) or very dark grayish brown (10YR 3/2 moist) noncalcareous very friable coarse weak platy very fine sandy loam that crushes to single grains; surface 1/4-inch a soft crust; grass roots abundant; abrupt smooth boundary.
- 1926
- AB 5 to 8 inches. Brown (10YR 5/3 dry) or dark grayish brown (10YR 4/2 moist) noncalcareous friable coarse and very coarse weak prismatic blocky very fine sandy loam; hard when dry; crushes to fine weak granules and single grains; grass roots plentiful; clear smooth boundary.
- 1927
- B21 8 to 14 inches. Brown (10YR 5/3.5 dry) or dark brown (10YR 4/3 moist) noncalcareous friable coarse to very coarse moderately developed prismatic medium blocky heavy very fine sandy loam; hard when dry; crushes to very fine weak granules and single grains; roots plentiful; gradual smooth boundary.
- 1928
- B22 14 to 21 inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/3 moist) noncalcareous friable weak very coarse prismatic blocky very fine sandy loam that crushes to weak fine granules and single grains; hard when dry; roots plentiful; gradual wavy boundary.
- 1929
- B3 21 to 28 inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/3 moist) noncalcareous very friable very coarse weak prismatic heavy loamy very fine sand that crushes to very fine weak granules and single grains; many fine roots; diffuse wavy boundary.
- 1930
- C1 28 to 42 inches. Pale brown (10YR 6/3 dry) or brown (10YR 4.2/3 moist) noncalcareous soft massive loamy very fine sand that crushes to single grains; weakly calcareous surrounding an occasional rock fragment; abrupt irregular boundary.
- 1931
- Dr 42 inches plus. (Not sampled.) Calcareous sandstone which probably belongs to the Monroe Creek formation.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Terry **LOCATION** Goshen County, Wyoming
loamy very fine sand

SOIL NOS. S53Wyo-8-9 **LAB. NOS.** 1932-1938

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS
		3A1										
		1B1a	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	
VERY COARSE SAND	COARSE SAND	MEDIUM SAND	FINE SAND	VERY FINE SAND	SILT	CLAY				> 2		
0-3	A11	-	0.7	0.8	19.7	57.5	12.7	8.6	81.5	4.2	-	lvfs
3-6	A12	-	0.4	0.4	23.1	55.5	11.0	9.6	81.7	3.4	-	lvfs
6-14	B2	-	0.2	0.4	20.5	56.7	11.3	10.9	81.5	3.2	-	vfs1
14-21	B3	-	-	0.6	19.9	57.6	12.2	9.7	82.1	3.8	-	vfs1
21-32	Cca	-	-	0.6	16.6	57.0	15.1	10.7	80.4	5.1	-	vfs1
32-47	C1	-	-	0.6	15.5	58.3	15.7	9.9	81.3	5.4	-	vfs1
47-61	C2	-	-	-	17.5	59.3	14.3	8.9	82.6	4.8	-	vfs1
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	CaCO ₃ equivalent	GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.
	1:5	1:10	ORGANIC CARBON %	NITROGEN %	C/N			%		%	%	%
6.5	6.6	6.7	1.02			<0.20	0.4	-				5.7
7.2	7.1	7.0	0.58			<0.20	0.5	-				5.2
7.4	7.5	7.2	0.42			<0.20	0.8	-	-			5.8
7.5	7.9	7.9	0.50			<0.20	0.7	-	-			6.0
7.8	8.3	8.6	0.37			<0.20	0.6	2	-			6.6
8.0	8.6	8.8	0.23			<0.20	0.7	3	-			6.8
8.1	8.6	9.0	0.16			<0.20	0.7	2	-			6.4
5A1a	5B1a		CATIONS			5B1b	5D	SAL SATURATION EXTRACT SOLUBLE			8A	
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE		EXCHANGEABLE			EXCH. Na %	6P1a	6Q1a				MOISTURE AT SATURATION %
	6N2b	6O2b	H	6P2a	6Q2a		Na	K				
	Ca	Mg		Na	K			← milliequivalents per liter →				
	← milliequivalents per 100g. soil →						← milliequivalents per liter →					
11.4	8.0	1.8		0.2	0.8	2	0.3	0.8				41.2
12.7	9.0	1.8		0.2	0.7	2	0.9	0.4				36.4
13.8	12.0	2.2		0.4	1.1	3	0.6	1.0				35.5
14.4		2.2		0.4	1.2	3	0.9	0.8				37.8
14.8		2.8		0.2	1.4	1	0.6	0.8				38.1
14.1		4.4		0.4	1.8	3	0.9	1.2				36.0
14.0				0.5	2.0	4	1.5	1.2				35.4

Soil type: Terry loamy very fine sand

Soil No.: S53Wyo-8-9

Location: Goshen County, Wyoming; 115 feet west and 145 feet south of east quarter corner of Section 22, T28N, R61W.

Vegetation: Permanent pasture; dominantly grama and niggerwool (*Carex filifolia*).

Slope: 4 percent upland; slightly convex, faces northeast; well drained.

Parent material: Eolian, calcareous loamy very fine sand overlying Miocene sandstone.

Note: Profile contained several krotovinas.

Described by: C. J. Fox, October 1953.

Horizon and

Mandan

Lab. Number

A11 1932	0 to 3 inches. Brown (10YR 5/3 dry) to dark brown (10YR 4/3 moist) noncalcareous very friable single grain loamy very fine sand; loose when dry; very friable 1/8-inch crust on surface; abrupt smooth boundary.
A12 1933	3 to 6 inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/3 moist) noncalcareous friable weak coarse prismatic blocky very fine sand that crushes to weak fine granules and single grains; hard when dry; roots plentiful; clear smooth boundary.
B2 1934	6 to 14 inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/2.5 moist) noncalcareous friable moderately developed medium prismatic blocky very fine sandy loam; hard when dry; roots plentiful; clear smooth boundary.
B3 1935	14 to 21 inches. Brown (10YR 5/3 dry) or dark brown (10YR 4/3 moist) noncalcareous friable coarse weak prismatic heavy loamy very fine sand; soil breaks into weak medium angular blocky units that crush to single grains; slightly hard when dry; roots plentiful; gradual irregular boundary.
Cca 1936	21 to 32 inches. Pale brown (10YR 6/3 dry) or brown (10YR 4/3 moist) very strongly calcareous very friable loamy very fine sand that removes in angular fragments that crush to single grains; slightly hard when dry; roots plentiful; gradual irregular boundary.
C1 1937	32 to 47 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) strongly calcareous very friable loamy very fine sand that removes in slightly hard angular fragments that crush to single grains; roots few; gradual irregular boundary.
C2 1938	47 to 61 inches. Pale brown (10YR 6/3 dry) or brown (10YR 5/3 moist) strongly calcareous single grained loamy very fine sand; abrupt irregular boundary.
D	61 inches plus. (Not sampled.) A mixture of weathered sandstone and lime concretions.

SOIL TYPE Ulm LOCATION Campbell County, Wyoming
loam

SOIL NOS. S54Wyo-3-3 LAB. NOS. 2464-2471

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURE 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)			
0-3	A1	0.4	0.4	0.6	12.9	28.8	39.5	17.4	59.9	19.3	-	1
3-5 1/2	B1	0.2	0.2	0.3	12.4	26.1	29.1	31.7	51.0	15.0	-	cl
5 1/2-10	B21t	0.1	0.2	0.2	10.4	24.0	29.5	35.6	47.4	15.3	-	cl
10-15	B22t	0.9	0.4	0.2	6.7	17.3	37.6	36.9	36.5	24.1	1	cl
15-24	B3ca	0.3	0.4	0.4	9.0	21.7	36.0	32.2	40.0	25.5	-	cl
24-35	C1ca	0.8	0.5	0.3	7.1	23.1	38.3	29.9	45.3	22.2	1	cl
35-45	C2ca	0.6	0.4	0.3	4.8	17.3	43.7	32.9	37.7	27.3	-	cl
45-53 1/2	R	-	0.2	0.2	3.9	15.2	46.5	34.0	36.7	28.4	-	cl

8C1b SATURATED PASTE	pH		ORGANIC MATTER			8A2 EST% SALT (BUREAU CUP)	ELECTRICAL CONDUCTIVITY EC x 10 ³ MILLIMHOS PER CM 8A1a	6E1a		MOISTURE TENSIONS 4B2		
	8C1a	8C1a	6A1a	6B1a	CaCO ₃ equiv- alent			GYPSUM mg./100g. SOIL	1/10 ATMOS.	1/3 ATMOS.	15 ATMOS.	
	1:5	1:10	ORGANIC CARBON %	NITROGEN %								C/N
6.4	6.7	6.8	1.27	.116	10.9	-	0.4	-				6.3
6.5	6.9	6.8	1.12	.114	9.8	-	0.4	1				11.3
7.3	7.5	7.3	0.90	.100	9.0	-	0.6	1				13.4
7.9	8.4	8.5	0.87	.098	8.9	-	0.6	10				14.2
8.0	8.8	8.8	0.52	.060	8.7	-	0.5	11				12.0
8.3	9.4	9.5	0.26			-	0.9	9				10.6
8.4	9.5	9.7	0.24			-	2.2	8				12.3
8.5	9.5	9.7	0.24			-	3.4	7				13.5

5A1a CATION EXCHANGE CAPACITY (NH ₄ Ac)	EXTRACTABLE CATIONS 5B1a					5D2 EXCH. Na %	8A1a SATURATION EXTRACT SOLUBLE		8A MOISTURE AT SATURATION %
	6N2b	6O2b	6P2a		6Q2a		6P1a	6Q1a	
	Ca	Mg	Na	K	K		K		
12.7	7.7	3.1	-	0.8	-	0.4	0.6		35.7
22.3	14.5	5.6	0.1	0.6	-	0.4	0.1		44.6
26.0	20.0	6.8	0.1	0.5	-	0.6	0.1		55.7
23.9			0.1	0.2	-	0.6	0.1		57.0
20.6			0.4	0.2	1	2.2	0.1		49.5
19.4			1.7	0.1	7	6.9	0.1		45.8
22.0			4.6	0.1	15	19.7	0.1		58.8
22.8			6.2	0.1	18	32.0	0.1		63.6

Soil type: Thin loam
 Soil No.: S54Wyo-3-3
 Location: Campbell County, Wyoming; northwest quarter of southeast quarter of Section 11, T43N, R73W
 Physiographic position: Upland.
 Topography: Slightly concave slope of approximately 4 percent facing southeast.
 Drainage: Well drained.
 Vegetation: Mainly blue grama and buffalograss, some needlegrass and sage.
 Use: Pasture.
 Collected by: L. T. Alexander, James Allen, Harold Bindschadler, and A. J. Cline, August 16, 1954.
 Described by: A. J. Cline.

Horizon and
 Lincoln
 Lab. Number

- A1
 2464 0 to 3 inches. Light brownish gray (10YR 6/2 dry) to dark grayish brown (10YR 4/2 moist) loam; soft, dry; very friable, moist; moderate fine platy breaking to moderate fine granular; noncalcareous; the horizon is slightly lighter-colored in the lower 1/2-inch; lower boundary clear and smooth.
- B1
 2465 3 to 5½ inches. Dark grayish brown (10YR 4/2.5 dry) to dark brown (10YR 3/3 moist) light clay loam; slightly hard, dry; friable, moist; weak medium subangular blocky; noncalcareous; aggregates have a weak coating of 10YR 8/2 in the upper portion of this horizon; there are a few very weak and patchy clay skins in the lower part; lower boundary clear and smooth.
- B21t
 2466 5½ to 10 inches. Yellowish brown (10YR 5/4 dry) to dark yellowish brown (10YR 4/4 moist) clay loam; hard, dry; firm, moist; strong medium prismatic breaking to strong medium angular blocky; noncalcareous; moderately thick prominent clay skins; lower boundary abrupt and smooth.
- B22t
 2467 10 to 15 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/3 moist) clay loam; hard, dry; firm, moist; moderate medium prismatic breaking to moderate medium angular blocky; calcareous; few indistinct clay skins; lower boundary clear and smooth.
- B3ca
 2468 15 to 24 inches. Light yellowish brown (2.5Y 6/3 dry) to light olive brown (2.5Y 5/4 moist) light clay loam; very hard, dry; firm, moist; weak coarse prismatic breaking to weak coarse angular blocky; calcareous; a few small concretions of calcium carbonate; lower boundary gradual and smooth.
- C1ca
 2469 24 to 35 inches. Pale olive (5Y 6/3 dry) to olive (5Y 5/3 moist) heavy loam; very hard, dry; firm, moist; massive to very weak coarse subangular blocky structure; calcareous; much accumulated calcium carbonate principally as lime flour but containing some concretionary and myceliated forms; a few small faint 2.5Y 5/6 mottles; lower boundary gradual and smooth.
- C2ca
 2470 35 to 45 inches. Pale olive (5Y 6/3 dry) to olive (5Y 5/3 moist) loam; hard, dry; friable, moist; massive; calcareous; horizon contains much accumulated lime chiefly as lime flour; few small faint 5Y 5/6 mottles; lower boundary gradual and smooth.
- R
 2471 45 to 53 inches plus. Pale olive (5Y 6/3.5 dry) to olive (5Y 5/3.5 moist) loam; hard, dry; friable, moist; massive; calcareous; a few small faint 5Y 5/6 mottles; this is a horizon of partially disintegrated very weakly indurated siltstone, loamstone, and sandstone of the Fort Union formation.

SOIL TYPE Ulm LOCATION Campbell County, Wyoming
loam

SOIL NOS. 854 Wyo-3-4 LAB. NOS. 2472-2478

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	0.02-0.001	< 0.001	> 2											
0-4 1/2	A1	0.4	1.7	3.4	18.4	22.0	38.1	16.0	53.1	19.9	-	1									
4 1/2-8	B1	0.2	0.9	2.1	14.7	21.2	34.8	26.1	48.3	18.4	-	1									
8-15	B21t	0.1	0.8	1.8	13.9	19.3	31.3	32.8	45.6	15.2	-	cl									
15-22	B22t	-	0.4	1.2	11.9	18.3	32.7	35.5	41.2	18.6	-	cl									
22-27	B3ca	0.5	0.5	0.7	9.6	17.9	37.4	33.4	40.1	22.6	-	ol									
27-38	C1ca	1.2	0.5	0.8	12.0	18.0	36.0	31.5	41.0	22.3	-	cl									
38+	C2ca	0.2	0.4	0.8	8.0	14.8	42.1	33.7	37.5	25.8	-	cl									
pH	8C1a	ORGANIC MATTER				6A2	ELECTRICAL CONDUCTIVITY EC-10 ³ MILLIMOS PER CM 8A1a	6E1a		MOISTURE TENSIONS											
		8C1a	6A1a	6B1a	EST% SALT (BUREAU CUP)			CoCO ₃ equiv-ent %	GYPSUM mg./100g. SOIL	1/10 ATMOS. %	1/3 ATMOS. %	15 ATMOS. %									
		1:5	1:10	ORGANIC CARBON %									NITRO-GEN %	C/N							
6.2	6.7	6.7	1.26	.116	10.9	-	0.5	-	-	-	-	6.1									
6.4	6.8	6.8	0.86	.089	9.7	-	0.6	1	-	-	-	8.8									
6.6	7.2	7.0	0.68	.074	9.2	-	0.4	-	-	-	-	12.0									
7.3	7.8	7.6	0.61	.069	8.8	-	0.4	1	-	-	-	13.3									
7.9	8.8	8.8	0.50	.060	8.3	-	0.5	4	-	-	-	12.4									
8.1	8.8	8.9	0.38			-	0.5	6	-	-	-	11.2									
8.1	9.0	9.0	0.36			-	0.7	6	-	-	-	12.4									
5A1a	EXTRACTABLE CATIONS 5B1a					5D2	SATURATION EXTRACT SOLUBLE 5A1				8A										
	6N2b	6O2b	6P2a		6Q2a		6P1a		6Q1a	EXCH. No %		MOISTURE AT SATURATION %									
	Ca	Mg	H	Na	K		Na	K													
← milliequivalents per 100g. soil →											← milliequivalents per liter →										
12.2	6.7	3.0		0.1	0.8	1	0.4	0.7				36.8									
17.3	10.2	5.3		-	0.5	-	0.6	0.2				40.2									
23.3	13.4	8.0		0.1	0.6	-	0.4	0.1				47.7									
27.5	16.3	11.8		0.1	0.4	-	0.7	0.1				53.1									
24.6				0.3	0.2	-	0.9	0.1				50.0									
22.2				0.4	0.2	1	1.8	0.1				48.0									
23.6				0.7	0.2	2	3.2	0.1				51.1									

Soil type: Uln loam
 Soil No.: S54Wyo-3-4
 Location: Campbell County, Wyoming; northeast quarter of southeast quarter of Section 8, T42N, R74W, 2 miles east of Pinetree, Wyoming.
 Physiographic position: Upland.
 Topography: Slightly convex slope of approximately 3 percent facing east.
 Drainage: Well drained.
 Vegetation: Short grasses, chiefly blue grama and buffalograss, sage, needlegrass, and occasional cactus.
 Use: Pasture.
 Collected by: L. T. Alexander, James Allen, Harold Bindschadler, and A. J. Cline, August 16, 1954.
 Described by: A. J. Cline.

Horizon and
 Lincoln
 Lab. Number

A1 2472	0 to 4½ inches. Light brownish gray (10YR 6/2.5 dry) to dark grayish brown (10YR 4/2 moist) light loam; soft, dry; very friable, moist; weak fine platy breaking to moderate very fine granular; non-calcareous; lower boundary clear and smooth.
B1 2473	4½ to 8 inches. Grayish brown (10YR 5/2.5 dry) to very dark grayish brown (10YR 3.5/2 moist) light clay loam; slightly hard, dry; friable, moist; weak to moderate medium subangular blocky structure; noncalcareous; lower boundary clear and smooth.
B21t 2474	8 to 15 inches. Brown (10YR 5/3 dry, 10YR 4/3 moist) clay loam; hard, dry; firm, moist; strong medium prismatic breaking to strong medium angular blocky; noncalcareous; moderately thick prominent clay skins; lower boundary gradual and smooth.
B22t 2475	15 to 22 inches. Light olive brown (2.5Y 5/3 dry) to olive brown (2.5Y 4/3 moist) clay loam; very hard, dry; firm, moist; strong medium prismatic breaking to strong medium angular blocky; noncalcareous; moderately thick prominent clay skins; lower boundary abrupt and smooth.
B3ca 2476	22 to 27 inches. Olive (5Y 5.5/3 dry, 5Y 4.5/3 moist) light clay loam; hard, dry; firm, moist; moderate medium angular blocky structure; calcareous; the horizon contains a few small concretions of calcium carbonate; lower boundary gradual and smooth.
C1ca 2477	27 to 38 inches. Pale olive (5Y 6/3 dry) to olive (5Y 5/3 moist) heavy loam; hard, dry; firm, moist; massive to weak coarse subangular blocky; calcareous; moderate amounts of accumulated calcium carbonate chiefly as lime flour but containing a few small concretions and mycelia; lower boundary gradual and smooth.
C2ca 2478	38 inches plus. Pale olive (5Y 6/3 dry) to olive (5Y 5/3 moist) heavy loam; hard, dry; firm, moist; massive; calcareous; grades to weakly indurated and only slightly weathered loamstone, siltstone, and sandstone of the Fort Union formation below 40 inches.

SOIL SURVEY LABORATORY Mandan, N. Dak.

SOIL TYPE Valentine **LOCATION** Goshen County, Wyoming
loamy fine sand

SOIL NOS. S50Wyo-8-6 **LAB. NOS.** 541-546

DEPTH INCHES	HORIZON	PARTICLE SIZE DISTRIBUTION (in mm.) (per cent)										TEXTURAL CLASS	
		1B1a											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	3A1		($< 19\mu$)		
0-3	A11	-	1.2	2.1	17.0	45.0	24.3	10.4	75.8	4.8	-	vfs1	
3-12	A12	1.2	2.8	5.1	43.3	25.4	13.3	8.9	62.0	3.0	2	lfs	
12-32	C1	0.8	2.2	6.9	63.6	14.2	4.7	7.6	53.3	1.7	1	fs	
32-49	C2	1.1	4.4	9.9	69.8	9.1	1.7	4.0	45.9	1.0	3	fs	
49-55	C3	14.0	6.7	4.6	47.6	16.6	4.8	5.7	51.2	1.4	44	s	
a		0.8	2.7	5.3	45.4	25.1	12.1	8.6	63.5	3.4	1	fs1	
pH		ORGANIC MATTER				8A2	ELECTRICAL CONDUCTIVITY	6E1a	6F1a	MOISTURE TENSIONS			
8C1b	8C1a	8C1a	6A1a	6B1a		EST% SALT (BUREAU CUP)	EC-10 ³ MILLIMHOS PER CM	CoCO ₂ equiv- alent	GYPSUM me./100g SOIL	4B1a	1/3	15	
SATURATED PASTE	1:5	1:10	ORGANIC CARBON %	NITRO-GEN %	C/N		8A1a	%		1/10 ATMOS.	ATMOS.	ATMOS.	
6.6	7.2	7.4	0.91	.083	11.0	-	0.4	-	-	32.4		6.5	
7.0	7.6	7.7	0.46	.047	9.8	-	0.4	-	-	17.9		4.8	
7.5	8.1	8.1	0.29	.027	10.7	-	0.4	-	-	10.8		4.2	
8.0	8.8	8.8	0.09	.010		-	0.3	-	-	6.6		2.4	
8.0	9.0	9.0	0.09	.012		-	0.4	-	-	9.1		3.2	
7.7	8.2	8.5	0.68	.067	10.1	-	0.5	-	-	17.0		4.6	
5A1a	5B1a	CATIONS				5B1b	5D2	SATURATION EXTRACT SOLUBLE				8A	
CATION EXCHANGE CAPACITY NH ₄ OAc	EXTRACTABLE			EXCHANGEABLE				6P1a	6Q1a			MOISTURE AT SATURATION	
	6N2b	6O2b	H	6P2a	6Q2a	EXCH. Na %		Na	K			%	
	milliequivalents per 100g. soil						milliequivalents per liter						
12.3	9.0	2.3		0.3	1.5	2		-	6.3			39.6	
9.8	7.1	1.9		0.3	1.0	3		-	7.7			27.3	
8.0	7.0	1.4		0.2	0.5	2		2.0	6.3			25.3	
4.8	4.3	1.2		0.3	0.5	6		1.6	3.2			24.9	
6.3				0.3	0.8b	5		2.3	-			21.5	
10.1	8.9	2.2		0.3	1.6b	3		2.2	-			27.8	

a. Composite irrigated surface sample from SEL/4 NWL/4 NWL/4 Sec. 28, T25N, R61W.
b. Not corrected for soluble K; soluble K is known to be under 0.25 me./100g.

Soil type: Valentine loamy fine sand

Soil No.: S50Wyo-8-6

Location: Southwest quarter of northwest quarter of northwest quarter of Section 28, T25N, R61W, Goshen County, Wyo.

Vegetation: Virgin pasture; sparse cover of blue grama and needlegrasses, sagebrush and cactus.

Physiography: Nearly level high terrace.

Described by: W. M. Johnson.

Horizon and

Mandan

Lab. Number

- | | |
|------------|---|
| A11
541 | 0 to 3 inches. Grayish brown (10YR 5/2 dry) to dark grayish brown (10YR 4/2 moist) soft, very friable, heavy loamy fine sand; weak fine subangular blocks crush easily to weak coarse and medium granules; noncalcareous; clear boundary. |
| A12
542 | 3 to 12 inches. Grayish brown (10YR 5/2.5 dry) to dark grayish brown (10YR 4/2 moist) weak prismatic, soft, very friable, heavy loamy very fine sand that breaks to weak blocks; noncalcareous; few roots; gradual boundary. |
| C1
543 | 12 to 32 inches. Brown (10YR 5/3 dry) to dark brown (10YR 4/3 moist) soft, very friable, very weak prismatic loamy fine sand; noncalcareous; few roots; gradual boundary. |
| C2
544 | 32 to 49 inches. Pale brown (10YR 6/3 dry) to brown (10YR 5/2.5 moist) slightly coherent loamy fine sand; calcareous; very few roots; gradual boundary. |
| C3
545 | 49 to 55 inches. Pale brown (10YR 6/2.5 dry) to brown (10YR 5/2.5 moist) loose gravelly loamy fine sand; mildly calcareous. |

SOIL TYPE Vasquez LOAM LOCATION Park County, Wyoming

SOIL NOS. S61Wyo-15-3 LAB. NOS. 15766-15773

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	0.02-0.001	< 19mm				
3-0	0	a	a	a	a	a	a	a	a	a	Tr.		
0-4	A11g	10.5	16.6	12.7	25.0b	7.8b	18.5	8.9	26.8	11.5	Tr.	cosl	
4-9	A12g	8.6	13.4	10.8	22.7b	9.4b	27.1	8.0	32.0	15.9	10	sl	
9-17	B211rg	21.4	20.2	13.0	21.7b	6.9b	11.6	5.2	22.2	6.4	21	lcos	
17-29	B22g	8.4	14.2	9.5	16.9	7.5b	28.9	14.6	27.1	17.3	19	sl	
29-43	B23g	9.5	13.0	8.3	14.3	7.1b	31.5	16.3	25.0	20.6	7	sl/1	
43-52	B24g	11.9	13.5	8.2	13.8	6.5	28.2	17.9	22.8	18.6	16	cosl	
52-57	B25g	10.0	12.5	7.7	14.3	7.4	30.1	18.0	24.9	19.7	14	l/sl	
8C1a		6C1a ORGANIC MATTER				Bulk Density					4B2		
pH		Ext. Iron	6A1a ORGANIC CARBON	6B1a NITROGEN	C/N	Field Moist		30 Cm.		A.D.	15-Bar Water		
1:1		%	%	%	%	% M.	g/cc	% M.	g/cc	g/cc	%		
4.5c		1.0	16.6	0.950	17								
5.0		0.9	3.12	0.228	14						8.1		
5.1		0.9	2.01	0.150	13						7.2		
5.2		1.3	0.28	0.021	13						3.7		
5.5		1.1	0.13	0.013							7.5		
6.0		1.3	0.13								8.1		
6.1		1.3	0.15								9.2		
6.1		1.5	0.15								9.5		
5A1a		EXTRACTABLE CATIONS					5C1	5C3	Ratios to Clay			6D1	Carbonate as CaCO ₃
CATION EXCHANGE CAPACITY NH ₄ OAc	6N2b	6O2b	6H1a	6P2a	6Q2a	Base Sat. % NH ₄ OAc Exch.	Base Sat. % on Sum Cations	15-Atm. Moist	Cat. Exch. Cap.	Iron	Whole Sample %	Clay Size %	
	milliequivalents per 100g. soil												
33.7	10.2	3.5	36.6	0.5	1.8	47	30						
15.5	1.7	0.7	17.7	0.1	0.1	17	13	0.91	1.74	.10			
15.1	1.2	0.6	18.9	0.1	0.1	13	10	0.90	1.89	.11			
9.8	2.6	1.3	7.9	0.1	<0.1	41	34	0.71	1.88	.25			
18.5	10.4	5.4	5.2	0.1	0.2	87	76	0.51	1.27	.08			
19.9	11.8	6.4	4.3	0.1	0.2	93	81	0.50	1.22	.08			
20.7	12.3	6.8	4.3	0.1	0.2	94	82	0.51	1.16	.07			
21.0	12.5	7.3	4.9	0.1	0.2	96	80	0.53	1.17	.08			

a. No PSD due to high organic matter content.
 b. Few mica flakes.
 c. 1:5 soil-water ratio due to high organic matter content.

Soil type: Vasquez loam

Soil No.: S61Wyo-15-3

Location: Park County, Wyoming; Deep Lake Quadrangle USGS, 15 min. series, topographic; 400 feet north of benchmark, elevation 10,536 feet, Cooke City Highway. The benchmark is one-half mile north of Gardner Lake near Gardner Headwall on the highway; pit is near south edge of a small lake. The area is unsurveyed.

Physiography: Flat-bottomed head of a blocked drainage. The valley bottom is 800 feet across with a small lake in the center; profile sampled on marshy shore of lake. The western valley side is a barren area of usual snow accumulation; eastern valley side is a steep rocky grassed mountain slope, characterized by a series of small solifluction terraces on the milder lower slopes and rocky polygon nets and rock stripes extending from the foot of the very steep slopes of the valley side to the rock outcrop at the top. The shore of the lake is a strongly hummocked marsh; hummocks are about 2 to 4 feet across, 10 to 15 inches high, and above narrow (1 to 2 feet across) continuous intervening barren lows.

Parent material: Local alluvium mantled with a layer of plant remains.

Vegetation: Hairgrass, sedges and moss.

Drainage: Very poor; ground water stands about 15 inches below the top of the mounds. Water was bucketed from the bottom of the hole as the pit was dug to permit sampling of the soil horizons above the water.

Temperature: 45 degrees F. at 33 inches; 42 degrees F. at 55 inches.

Sampled by: R. C. McConnell, T. J. Nimlos, R. Taber, and C. A. Mogen, August 25, 1961.

Horizon and

Lincoln

Lab. Number

- 0 3 to 0 inches. Dark reddish brown (5YR 2/2, dry or moist) fibrous peat; abundant roots.
15766
- A1lg 0 to 4 inches. Mottled black and very dark brown (2.5Y 2/2 and 7.5YR 2/2 moist) in large pattern fine sandy loam, 10YR 5/1 dry with many large mottlings of 5YR 4/6 of plant fibers and soil; massive structure; hard, nonsticky and nonplastic; very dark brown mottling is largely associated with concentration of roots; at 4 to 5 inches (unsampled) there is a discontinuous very gravelly loam which is yellowish red (5YR 3/8 moist); matted concentration of roots; abrupt broken boundary.
15767
- A12g 4 to 9 inches. Very dark gray (10YR 3/1 moist) heavy sandy loam, 10YR 5/2 and 6/2 when dry with many fine faint and few medium distinct 5/8 mottlings; massive structure; very hard, firm (brittle), slightly sticky and slightly plastic; discontinuous horizontal bands of dark reddish brown, 1/8- to 1/4-inch thick (three in this horizon); abrupt very irregular boundary.
15768
- B21lg 9 to 17 inches. Dark brown (7.5YR 4/2 moist) light loamy sand, 7.5YR 5/6 dry; massive structure; non-sticky and nonplastic; nearly all sand grains are stained; abrupt smooth boundary.
15769
- B22g 17 to 29 inches. Dark grayish brown (10YR 4/2 moist) fine gravelly clay loam with many fine distinct dark yellowish brown mottlings (10YR 3/4 moist); moist color crushed is 10YR 4/4, 10YR 6/3 and 6/4 when dry in medium and large mixed pattern; moderate medium platy structure; very hard, friable, slightly sticky and slightly plastic; common fine vertical pores; gradual boundary.
15770
- B23g 29 to 43 inches. (Sampled 37 to 43 inches.) Dark yellowish brown (10YR 4/4 moist) fine gravelly heavy clay loam, 10YR 5/6 with many fine faint 6/3 mottlings when dry; moderate medium platy structure; very hard, firm, sticky and plastic; few fine vertical pores; surface of plates has a glossy appearance and is olive brown (1Y 4/3) moist; gravel unstained but there are common medium sand-sized black concretions; gradual boundary.
15771
- B24g 43 to 52 inches. Mottled dark yellowish brown and olive brown (10YR 4/4 and 2.5Y 4/3 moist) fine gravelly heavy clay loam, 1Y 5/4, 6/4 and 7/2 in a very fine pattern dry; weak coarse platy structure; very hard, firm, sticky and plastic; gradual boundary.
15772
- B25g 52 to 57 inches. Mottled brown and dark yellowish brown (10YR 4/3 and 4/4 moist) fine gravelly heavy clay loam, 10YR 6/6 and 5/6 dry; very hard, firm, sticky and plastic; moderate angular blocky structure arranged in moderate coarse plates; ped surfaces glisten when moist.
15773

MICROMORPHOLOGY:

Grain Studies: (Method 7B1)

Quartz and feldspar dominate the very fine sand. Only a trace of volcanic ash is present. The surface is estimated to have 2 percent hornblende, which increases noticeably in the B horizons at the expense of quartz and feldspar. Chloritic minerals in the surface are estimated at 30 percent and increase in the B horizon.

SOIL TYPE Vasquez clay loam LOCATION Park County, Wyoming

SOIL NOS. S61Wyo-15-4 LAB. NOS. 15774-15778

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	(10mm)			
	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				
3-0	0	a	a	a	a	a	a	a	a	a	Tr.		
0-4	A1	3.6	4.6	2.5	5.1b	5.4b	45.5	33.3	25.5	28.1	Tr.	cl	
4-10	B21irg	13.2	14.7	7.4	11.2b	6.7b	30.1	16.7	22.8	19.4	22	cosl	
10-30	B22g	15.2	18.6	11.2	18.3b	9.4b	19.2	8.1	29.3	8.3	26	cosl	
30-41	B23irg	14.6	17.3	11.1	20.2b	10.5b	21.3	5.0	28.6	13.2	46	cosl	
8C1a		6C1a	ORGANIC MATTER			Bulk Density					4B2		
pH 1:1		Ext. Iron as Fe	6A1a	6B1a		Field Moist		30 Cm.		A.D.	15-Bar Water		
		%	%	%	C/N	% M.	g/cc	% M.	g/cc	g/cc	%		
5.2c		1.3	21.6	1.17	18						42.6		
5.3c		1.9	9.28	0.641	14						26.0		
5.1		9.9	4.49	0.259	17						18.8		
4.4		0.8	0.25	0.014							4.2		
5.9		0.8	0.07								2.4		
5A1a	EXTRACTABLE CATIONS 5B1a					5C1	5C3	Ratios to Clay 8D1 Carbonate					
CATION EXCHANGE CAPACITY NH ₄ OAc	6N2b	6O2b	6H1a	6P2a	6Q2a	Base Sat. % NH ₄ OAc Exch.	Base Sat. % on Sum Cations	15-Atm. Moist.	Cat. Exch. Cap.	Iron	as CaCO ₃	Whole Sample	Clay Size
	Ca	Mg	H	Na	K						%	%	
	← milliequivalents per 100g. soil →												
47.5	24.1	5.9	46.8	0.3	0.9	66	40						
38.0	24.0	3.7	32.4	0.3	0.3	74	47	0.78	1.14	.06			
28.2	6.8	1.6	37.6	0.1	0.2	31	19	1.12	1.69	.59			
7.8	3.2	1.0	4.2	Tr.	0.1	55	50	0.52	0.96	.10			
6.1	4.3	1.1	2.1	0.1	0.1	92	73	0.48	1.22	.16			

- a. No PSD due to high organic matter content.
- b. Few mica flakes.
- c. 1:5 soil-water ratio due to high organic matter content.

Soil type: Vasquez clay loam

Soil No.: S61Wyo-15-4

Location: Park County, Wyoming; Mount Maurice Quadrangle, 15 min. series, topographic; 1,320 feet south of milepost 82, elevation 10,073 feet, on the state line between Montana and Wyoming; the milepost is about 1,320 feet east of the Cooke City Highway where it crosses the state line. The area is unsurveyed.

Physiography: Sample was taken on the gently sloping western edge of a 600-foot wide, 1/2-mile long, hanging valley in the Boundary Lakes area of the Beartooth Plateau; profile was exposed in the edge of a 6-foot wide hummock on the edge of a 3-foot high terrace that has a 4-percent slope from the west edge of the valley and a 13-percent slope northeast down the terrace slope. An open pool of water, 75 feet to the west, is at the very edge of the valley floor adjoining the very stony foot of the valley wall. Water runs east in a stream 50 feet north of the sample site and the ground water moves through the soil just below the surface of the troughs surrounding the hummocks. South-southwest of the sample site the lower slopes of the valley wall are steep; this together with about 50 feet of the first terrace of the valley bottom is nearly barren of vegetation and usually is covered with snow throughout the summer months. Streams of cold water (35 degrees F.) flow out at the base of the valley wall.

Parent material: Stratified glacial deposits.

Vegetation: Willow sedge.

Temperature at 3:30 P.M.: 68 degrees F. ground level; 39 degrees at 41 inches; 35 degrees, water flowing out of base of west valley side.

Collected by: R. C. McConnell, T. J. Nimlos, R. D. Taber, and C. A. Mogen, August 25, 1961.

Horizon and

Lincoln

Lab. Number

O 3 to 0 inches. Dark reddish brown (5YR 3/2 and 2/2 mixed) dry or moist peat; fibrous; matted with roots; 15774 abrupt boundary.

A1 0 to 4 inches. Very dark brown (7.5YR 2/2 moist) silt loam, 7.5YR 5/1 dry with many large prominent mottlings of 7.5YR 3/2 and 4/4, mostly of plant fibers; massive structure; slightly sticky and slightly plastic; abundant roots; abrupt very irregular boundary.

B21rig 4 to 10 inches. Dark reddish brown (3.5YR 3/4) and dark red (2.5YR 3/6) moist gravelly loam, 5YR 4/8 15776 centers, 7.5YR 5/8 outside of large masses with common medium distinct N 6/ mottlings; 25 percent cobbles and stones in thick horizon; dense root mat around each fragment; in places the red color is confined entirely to the root mat up to 1/4-inch thick and staining the coarse fragments; massive structure; slightly sticky and slightly plastic; abrupt very irregular and broken boundary with small patches of the horizon isolated by the horizon below contacting the A1 horizon.

B22g 10 to 30 inches. Very dark gray (10YR 3/1 moist) sandy loam, 10Y 5/1 dry; massive structure; very hard, 15777 firm (brittle); nonsticky and nonplastic; abundant roots; abundant mica; occasional coarse fragment, about 30 percent coarse gravel; abrupt and very irregular boundary.

B23rig 30 to 41 inches. Mottled reddish brown and dark yellowish brown with large masses of dark gray in upper 15778 part (5YR 4/4, 10YR 4/4 and 10Y 4/1) gravelly sandy loam, 10YR 6/3 when dry.

MICROMORPHOLOGY:

Grain Studies: (Method 7B1)

Quartz and feldspar dominate the very fine sand. Only a trace of volcanic ash is present. The surface is estimated to have 20 percent hornblende. Chloritic minerals in the surface are estimated at 15 to 20 percent. About 10 percent of the grains in the B horizon are opaque. Some of these are iron-oxide nodules and others are iron-coated primary minerals. Iron reduction removes the opaques and the mineral suite then resembles that of adjacent horizons. The samples change immediately from brown to gray colors when iron is removed.