Form 10-226
(April 1966)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

B
48

INVESTIGATOR'S ANNUAL REPORT – + Prob. Final

(Natural Sciences Research)

This form is to be completed by the researcher and returned to the Superintendent of the Park by JANUARY 1. See reverse for additional instructions.

TO	PARK	REGION
SUPERINTENDENT	CRATERS OF THE MOON NATIONAL MONUMENT	PACIFIC NW

1. Project Title

Vegetative - Soil Analysis of the Carey Kipuka

2. Name(s) of Researcher(s) and Institution(s)

Erasmus W. Williams and Vern K. Hugie — Soil Conservation Service, U.S. Department of Agriculture

3. Source(s) and Amount(s) of Funds Other Than NPS, if Any

Soil Conservation Service

4. Starting Date of Project	5. Percent Completion of Project to Date:	6. Est. Additional Time Required for Completion Beyond January 1st:
June 1958	_____	_____ Years _____ Months

7. Summary: (a) of progress; (b) of significant findings, if any, to date; (e) recommendations regarding future course, i.e., on basis of work so far, should it proceed as planned, be reoriented, expanded, reduced, time schedule and support level adjusted, etc.;

The Soil-Range Project, Soil Conservation Service, has completed their soil-vegetation yield studies in the Carey Kipuka. No work is planned for 1971.

Soil profile descriptions and vegetation yield data by plant species is attached.

Monitoring of these sites were done again in 1975-77
See 2nd part of this for the report.

(Use Additional Sheets if Necessary)

8. Signature of Investigator: Vern K. Hugie — Date: 11/30/70

9. RSP Number: CRA-N-3

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, WRTSC
701 N. W. Glisan Street, Portland, Oregon 97209

November 30, 1970

Mr. Paul Fritz
Superintendent,
Craters of the Moon National Monument
Arco, Idaho 83213

Dear Mr. Fritz:

Thank you for your letter of November 12, 1970 and your continued interest in the Soil-Range Project's work on the Carey Kipuka.

Enclosed are the completed forms, #10-226, soil profile descriptions and total annual yield records by plant species of study sites completed within and near the Carey Kipuka.

At present we have no plans for continued work in the Kipuka.

At this time I should like to personally thank you and the Craters of the Moon National Monument staff for the fine cooperation and friendship you have extended us.

Sincerely,

J W Williams Jr.

Vern K. Hugie
Soil Scientist

Enclosures

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 5-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Northern end of Laidlaw Park, 25 miles, via road, from Carey, Blaine County, Idaho. It is in the NE¼, Sec. 32, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent north-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: This pedon is similar to the Bancroft series except it is underlain by bedrock at a depth of 52 inches. It is characterized by a neutral, mollic epipedon, a neutral, argillic horizon and a moderately alkaline calcic horizon.

Cicada nymph burrowing between the 10 and 36 inch depth has modified the soil structure.

Roots of Lupine and threetip sagebrush were observed to bedrock, 52 inches. Idaho fescue roots were observed to a depth of 36 inches.

PEDON: Pedon is described under vegetation likely altered by grazing. Color is for dry soil unless otherwise stated.

A11 0-3" (Bare area between vegetation) Dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, nonplastic; many vesicular pores; few roots; surface cracks form a prominent polygonal pattern; neutral (pH 6.6 BTB); common pebbles; clear smooth boundary.

A12 3-10" Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular structure; soft; friable; nonsticky, slightly plastic; many medium and fine tubular pores; many roots; neutral (pH 6.6 BTB); common basalt pebbles; clear smooth boundary.

B21 10-16" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, slightly plastic; many fine and medium tubular pores; many roots; neutral (pH 6.6 BTB); gradual smooth boundary.

B22t 16-28" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic breaking into moderate medium angular, subangular and cylindrical blocky structure; extremely hard; friable; slightly sticky, slightly plastic; common fine tubular pores; common roots; neutral (pH 6.6 BTB); thin patchy clay films; clear wavy boundary.

B3ca 28-36" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; extremely hard; friable; slightly sticky, plastic; strong effervescence; secondary carbonates as veins, coatings on peds and soft pockets; mildly alkaline (pH 7.8 PR); common roots; common medium and fine tubular pores; clear wavy boundary.

IIC1ca 36-46" Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak coarse prismatic breaking to moderate fine angular blocky structure; very hard; firm; sticky, plastic; few roots; few fine tubular pores; strong to violent effervescence; secondary carbonates as veins and coatings on peds; moderately alkaline (pH 8.2 TB); clear irregular boundary.

IIC2ca 48-52" Very pale brown (10YR 8/3) silty clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; sticky, plastic; few roots; many medium and fine tubular pores; violent effervescence; secondary carbonates disseminated and as veins and soft pockets; moderately alkaline (pH 8.3 TB); abrupt irregular boundary.

IIIR 52" + Basalt.

IDAHO 5-64

Precip: 14-16"
Elevation: 5000'
Slope: N 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Agropyron riparium	268	43
Poa secunda & nevadensis	102	16
Agropyron spicatum	77	12
Festuca idahoensis	53	8
Koeleria cristata	4	1
Carex filifolia	18	3
Forbs		
Phlox hoodii	39	6
Phlox longifolia	10	1
Astragalus convallarius	5	1
Erigeron pumilus	2	T
Annuals		
Bromus tectorum	T	T
Other annuals	3	T
Woody Plants		
Artemisia tripartita	40	7
Chrysothamnus viscidiflorus	12	2
Total Annual Yields	633	100
Total Estimated Litter	910	

1/ Other annuals include Chenopodium album, Cordylanthus ramosus and Cryptantha watsonii.

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 1-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: North end of Laidlaw Park near the "thumb", 25 miles, via road, from Carey, Blaine County, Idaho. It is in the NW¼, Sec. 21, T1S, R24E (BPM); 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping undulating upland, one percent southwest-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: Bare surface soil, 0-2 inches, cracks upon drying and the cracks form a prominent polygonal pattern. Polygons have weak thin platy structure, contain few roots and many vesicular pores. Bare surface soil is slightly lighter in color than surface soil under vegetation.

Cicada nymph burrowing between the 10 and 23 inch depth has influenced soil structure.

Soil is similar to Bancroft silt loam, moderately deep over bedrock variant, Idaho 9-59, except the argillic horizon contains a higher percentage of clay and it is deeper to bedrock.

Idaho fescue roots were observed to a depth of 38 inches and roots from threetip sagebrush to a depth of 41 inches, bedrock.

Soil is characterized by a neutral, mollic epipedon, a neutral, argillic horizon and a moderately alkaline calcic horizon.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-6"	(Under vegetation) Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and fine platy structure; very soft; friable; slightly sticky, slightly plastic; many fine roots; many medium and fine interstitial pores; neutral (pH 6.6 BTB); few fine basalt pebbles; clear smooth boundary.
A12	6-10"	Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard; friable; slightly sticky, slightly plastic; many fine roots; many medium and fine tubular pores; neutral (pH 6.6 BTB); few basalt pebbles; clear smooth boundary.
B21	10-15"	Brown (10YR 5/3) heavy silt loam, dark brown (10YR 3/3) moist; moderate medium angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; common fine roots; common medium and fine tubular pores; common weathered basalt pebbles; neutral (pH 6.6 BTB); gradual smooth boundary.
B22t	15-23"	Pale brown (10YR 6/3) light silty clay loam, brown (10YR 4/3) moist; weak prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; very hard; firm; slightly sticky, plastic; common fine roots between soil peds; neutral (pH 7.2 BTB); thin patchy clay films; common weathered basalt pebbles; few fine tubular pores; clear smooth boundary.
B23	23-28"	Brown (10YR 5/3) heavy silty clay loam, brown (10YR 4/3) moist; weak prismatic breaking to moderate medium and fine angular blocky structure; very hard; firm; sticky, plastic; few roots mostly between soil peds; thin patchy clay films; mildly alkaline (pH 7.4 BTB); common weathered basalt pebbles; clear wavy boundary.
B23ca	28-35"	Brown (10YR 5/3) heavy silty clay loam, brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium angular blocky structure; very hard; firm; sticky, plastic; few fine roots between soil peds; strong effervescence; secondary carbonates disseminated and as veins on prisms; moderately alkaline (pH 8.4 TB); common weathered basalt pebbles; thin patchy clay films; clear irregular boundary.
C1ca	35-41"	Very pale brown (10YR 8/3) silty clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; sticky, plastic; few roots; common very fine tubular pores; violent effervescence; secondary carbonates as thick veins and pockets; moderately alkaline (pH 8.4 TB); abrupt irregular boundary.
IIR	41"	Fractured basalt.

IDAHO 1-64

Precip: 14-16"
Elevation: 5000'
Slope: SW 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Agropyron spicatum	212	25
Festuca idahoensis	165	19
Poa secunda	111	13
Koeleria cristata	78	9
Agropyron riparium	3	T
Carex filifolia	36	4
Forbs		
Astragalus convallarius	28	3
Crepis acuminata	25	3
Phlox hoodii	12	2
Astragalus filipes	10	1
Phlox longifolia	4	T
Lomatium triternatum	3	T
Calochortus nitidus	1	T
Other Forbs 1/	T	T
Annuals		
Bromus tectorum	T	T
Cordylanthus ramosus	2	T
Woody Plants		
Artemisia tripartita	124	15
Chrysothamnus viscidiflorus	30	4
Tetradymia canscens	12	2
Total Annual Yields	856	100
Total Estimated Litter	1106	

1/ Other forbs include Agoseris glauca, Allium acuminatum and Lomatium triternatum.

11/10/69 V.K.H.

BANCROFT SILT LOAM, NONCALCAREOUS VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 2-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Northern end of Laidlaw Park near the "thumb", 25 miles, via road, east of Carey, Blaine County, Idaho. It is in the NW¼, Sec. 28, T1S, R24E (BPM), 43° 21' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent northwest-facing slope.

CLASSIFICATION: Bancroft silt loam, noncalcareous variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: This pedon is similar to the Bancroft series except it is noncalcareous, has a pH below 7.0 to a depth of 53 inches and lacks a calcic horizon. On the basis of soil laboratory data in the vicinity it is assumed that saturation with sodium and potassium increases with an increase in depth to 43 inches. It is, therefore, classified as a Calcic Argixeroll. Pedon is characterized by a slightly acid, mollic epipedon, a neutral, argillic horizon and a neutral C horizon.

Cicada nymphs have influenced soil structure between 13 and 46 inch depth.

Basalt pebbles are scattered throughout the profile but their number increased sharply below a depth of 46 inches. Basalt stones occurred below a depth of 36 inches.

This study is located in a position to receive run-on from surrounding areas.

PEDON: Pedon is described under near potential vegetation. Area is currently being grazed by cattle. Color is for dry soil unless otherwse stated.

A1	0-6"	(Under vegetation) Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial and common fine tubular pores; slightly acid (pH 6.4 BTB); clear smooth boundary.
A12	6-13"	Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; slightly acid (pH 6.4 BTB); gradual smooth boundary.
B21t	13-19"	Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic breaking into moderate medium subangular, angular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; thin patchy clay films in pores; common fine roots; many fine and common medium tubular pores; slightly acid (pH 6.2 BTB); gradual smooth boundary.
B22t	19-28"	Brown (10YR 5/3) heavy silt loam, dark brown (10YR 4/3) moist; weak medium and coarse prismatic breaking into moderate medium angular, subangular and cylindrical blocky structure; extremely hard; friable; slightly sticky, plastic; thin patchy clay films in pores and as bridges between soil particles; common fine roots mostly between soil peds; many fine tubular pores; neutral (pH 6.6 BTB); bleached sand and silt grains on vertical ped faces; gradual smooth boundary.
B3	28-36"	Brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; weak medium subangular, angular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; few roots; many medium and fine tubular pores; bleached sand and silt grains on ped vertical faces; neutral (pH 6.6 BTB); gradual smooth boundary.
C1	36-46"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium subangular, angular and cylindrical blocky structure; hard; friable; slightly sticky, plastic; few roots; many fine tubular pores; common basalt stones and pebbles; neutral (pH 6.8 BTB); clear smooth boundary.
IIC2	46-53"	Brown (10YR 5/3) silty clay loam, dark brown (10YR 3/3) moist; massive; hard; firm; sticky, plastic; few roots; many fine tubular pores; many fine pebbles and basalt stones; neutral (pH 6.8 BTB).

IDAHO 2-64

Precip: 14-16"
Elevation: 5000'
Slope: NW 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Festuca idahoensis	295	21
Koeleria cristata	101	7
Agropyron spicatum	59	4
Poa secunda	25	2
Stipa columbiana	23	2
Agropyron riparium	5	T
Carex filifolia	105	7
Forbs		
Lupinus spp.	227	16
Phlox longifolia	18	1
Phlox hoodii	5	T
Astragalus convallarius	4	T
Annuals		
Cordylanthus ramosus	17	1
Woody Plants		
Artemisia tripartita	539	38
Chrysothamnus viscidiflorus	12	1
Tetradymia canscens	1	T
Total Annual Yields	1436	100
Total Estimated Litter	1231	

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 4-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Northern end of Laidlaw Park near the "thumb", 25 miles, via road, east of Carey, Blain County, Idaho. It is in the NE¼, Sec. 32, T1S, R24E (BPM), 43° 20'N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent north-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: This soil is similar to the Bancroft series, except it is underlain by bedrock at a depth of 48 inches. This pedon is characterized by a slightly acid, mollic epipedon, a neutral, argillic horizon and a calcic horizon. Bedrock occurs at a depth of 48 inches.

Cicada nymph burrowing has influenced soil structure between 7 and 35 inches deep.

Roots of Idaho fescue and bearded bluebunch wheatgrass were observed to a depth of 35 inches. Threetip sagebrush roots penetrated to bedrock, 48 inches.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11 0-3" (Bare area between vegetation) Dark grayish brown (10YR 4/2) light silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine platy structure; soft; friable; nonsticky, nonplastic; few roots; surface cracks and forms a prominent polygonal pattern; many vesicular pores; slightly acid (pH 6.4 BTB); common scattered basalt pebbles; clear smooth boundary.

A12 3-7" Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft; friable; nonsticky, slightly plastic; many medium and fine tubular pores; many medium and fine roots; slightly acid (pH 6.4 BTB); common basalt pebbles; clear smooth boundary.

B1 7-17" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; many roots; many fine tubular pores; neutral (pH 6.6 BTB); common basalt pebbles; gradual smooth boundary.

B2t 17-28" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium and coarse prismatic breaking into moderate angular, subangular and cylindrical blocky structure; thin patchy clay films; common roots mostly between soil peds; many fine tubular pores; neutral (pH 6.8 BTB); common basalt pebbles; clear wavy boundary.

B3ca 28-35" Pale brown (10YR 6/3) light silty clay loam, brown (10YR 4/3) moist; moderate medium subangular, angular and cylindrical blocky structure; hard; friable; slightly sticky, plastic; few roots; many fine tubular pores; strong effervescence; secondary carbonates disseminated and as veins and soft pockets; moderately alkaline (pH 8.2 TB); many basalt pebbles; clear wavy boundary.

IIC1ca 35-41" Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure; very hard; friable; sticky, plastic; common fine tubular pores; few roots; strong effervescence; secondary carbonates as thick veins; moderately alkaline (pH 8.4 TB); many basalt pebbles; clear wavy boundary.

IIC2ca 41-48" Very pale brown (10YR 8/3) stony silt clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; sticky, plastic; many fine tubular pores; few roots; violent effervescence; secondary carbonates disseminated; moderately alkaline (pH 8.4 TB); 40 percent basalt stones; abrupt irregular boundary.

IIIR 48" + Basalt.

IDAHO 4-64

Precip: 14-16"
Elevation: 5000'
Slope: N 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Festuca idahoensis	150	17
Agropyron spicatum	145	16
Poa secunda & nevadensis	68	8
Koeleria cristata	29	3
Agropyron riparium	28	3
Elymus cinereus	16	2
Stipa columbiana	16	2
Carex filifolia	25	3
Forbs		
Lupinus spp.	48	5
Phlox hoodii	26	3
Astragalus cibarius	6	1
Astragalus convallarius	6	1
Phlox longifolia	4	T
Other Forbs 1/	4	T
Annuals		
Cordylanthus ramosus	27	3
Woody Plants		
Chrysothamnus viscidiflorus	154	17
Artemisia tripartita	104	12
Tetradymia canscens	35	4
Total Annual Yields	891	100
Total Estimated Litter	670	

1/ Other forbs include Agoseris glauca, Calochortus nitidus, Erigeron pumilus and Lomatium triternatum.

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER CLAY VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 5-60

ELEVATION: 5270' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: North central part of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the NE¼, Sec. 19, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain upland, 10 percent southwest-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over clay variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basaltic ash and cinders.

REMARKS: This pedon is similar to Bancroft silt loam, moderately deep over bedrock variant, Idaho 9-59, and Bancroft silt loam, deep over bedrock variant, Idaho 1-64. It differs from both of these pedons in that it is underlain by silty clay at a depth of 53 inches and has a silty clay substratum.

Surface soil, 0-3 inches, under vegetation is slightly darker in color than the bare surface soil.

Cicada nymph burrowing has influenced soil structure of horizons between the depth of 8-42 inches.

Roots of Idaho fescue and bearded bluebunch wheatgrass were observed to a depth of about 42 inches. Roots of big sagebrush extended below the bottom of the soil pit, 66 inches.

Pedon is characterized by a slightly acid, mollic epipedon, a neutral argillic horizon and a moderately alkaline calcic horizon. This soil is underlain by a silty clay, lithologic discontinuity at a depth of 52 inches.

PEDON: Pedon is described under vegetation that appears to have been altered extensively by rodents. Color is for dry soil unless otherwise stated.

A11	0-3"	(Bare surface soil between plants) Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and thin platy structure; soft; very friable; nonsticky, slightly plastic; few roots; many vesicular pores; surface cracks form a moderate polygonal pattern; slightly acid (pH 6.4 BTB); common basalt pebbles; clear smooth boundary.
A12	3-8"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure; soft; friable; nonsticky, slightly plastic; many roots; many medium and fine interstitial pores; slightly acid (pH 6.1 BTB); many basalt pebbles; many rodent krotovina; clear irregular boundary.
B21	8-19"	Brown (10YR 5/3) heavy silt loam, dark brown (10YR 3/3) moist; moderate medium and fine angular, subangular and cylindrical blocky structure; hard; firm; slightly sticky, plastic; many fine roots; many medium and fine tubular pores; neutral (pH 6.6 BTB); common basalt pebbles; diffuse smooth boundary.
B22t	19-32"	Brown (10YR 5/3) heavy silt loam, brown (10YR 4/3) moist; moderate, medium and fine angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; common roots; common medium and fine tubular pores; thin patchy clay films; neutral (pH 6.8 BTB); common basalt pebbles; abrupt wavy boundary.
C1ca	32-42"	Pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate, medium subangular, cylindrical and angular blocky structure; extremely hard; friable; slightly sticky, slightly plastic; common roots; many medium and fine tubular pores; moderately alkaline (pH 8.4 TB); strong effervescence; carbonates as fine veins and disseminated; few basalt pebbles; gradual smooth boundary.
C2ca	42-53"	Pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak subangular blocky structure; hard; friable; slightly sticky, slightly plastic; few roots; many medium and fine tubular pores; moderately alkaline (pH 8.4 TB); strong effervescence; carbonates as thin veins and disseminated; few pebbles of basalt; many basalt stones; abrupt wavy boundary.
IIC3ca	53-59"	Dark brown (10YR 4/3) silty clay, dark brown (10YR 3/3) moist; moderate medium and coarse prismatic structure; extremely hard; very firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; moderately alkaline (pH 8.4 TB); violent effervescence on prism faces but weakly effervescent near center of prisms; carbonates as veins and coating on prisms; common basalt pebbles; many concretions and flakes of manganese; clear irregular boundary.
IIC4ca	59-66"	Brown (10YR 4/3) silty clay loam, dark brown (10YR 3/3) moist; moderate fine angular blocky structure; very hard; firm; sticky, plastic; few roots; common medium and fine tubular pores; moderately alkaline (pH 8.4 TB); strong effervescence; carbonates as veins and coatings on peds; many concretions and flakes of manganese; many weathered basalt pebbles; abrupt irregular boundary.
IIIR	66"	Basalt bedrock.

IDAHO 5-60

Precip: 14-16"
Elevation: 5270'
Slope: SW 10%

TOTAL ANNUAL YIELDS 1960-1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses				
Elymus cinereus	57	6	45	4
Agropyron spicatum	49	5	46	4
Festuca idahoensis	26	3	32	3
Poa secunda	17	2	26	2
Sitanion hystrix	-	-	4	T
Forbs				
Balsamorhiza sagittata	42	4	38	4
Crepis acuminata	37	4	42	4
Phlox longifolia	21	2	16	2
Lupinus leucophyllus	17	2	16	2
Lomatium triternatum	11	1	17	2
Allium acuminatum	9	1	15	1
Other Forbs 1/	11	1	8	1
Annuals				
Bromus tectorum	187	20	261	26
Other annuals 2/	75	8	59	6
Woody Plants				
Artemisia tridentata	269	28	251	25
Artemisia tripartita	72	8	94	9
Chrysothamnus viscidiflorus	42	4	19	2
Chrysothamnus nauseosus	12	1	31	3
Total Annual Yields	954	100	1020	100
Total Estimated Litter	1634		1430	

1/ Other forbs include Agoseris glauca, Delphinium nelsoni, Senecio integerrimus and Tragopogon dubius.

2/ Other annuals include Chenopodium album, Collinsia parviflora, Collomia tenella, Cordylanthus ramosus, Cryptantha watsonii, Descurainia sophia, Gayophytum racemosum, Lappula redowshii and Mentzelia spp.

11/10/69 V.K.H.

HOELZLE SILT LOAM, DEEP VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 6-60

ELEVATION: 5010' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Gently sloping area near the center of the east side of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in Sec. 20, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, 4 percent southwest-facing slope.

CLASSIFICATION: Hoelzle silt loam, deep variant, a member of the fine, montmorillonitic, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and basaltic ash and cinders.

REMARKS: This pedon is very similar to the soil described at study Idaho 17-58, except its argillic horizon is 15 inches deeper.

Cicada nymph burrowing down to a depth of 38 inches have directly influenced soil structure in the horizon between 9 and 38 inches.

Roots of Idaho fescue were observed to a depth of about 40 inches and threetip sagebrush roots to a depth of about 50 inches.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A11 0-3" (Bare area between vegetation) Brown (10YR 5/3) light silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; few fine roots; many fine, medium and coarse vesicular pores; slightly acid (pH 6.4 BTB); common fine basalt pebbles; surface cracks form a prominent polygonal pattern; clear smooth boundary.

A12 3-9" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak subangular blocky structure; soft; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; common fine basalt pebbles; slightly acid (pH 6.4 BTB); common krotovina; clear wavy boundary.

B1 9-17" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium, subangular angular and cylindrical blocky structure; hard; firm; slightly sticky, slightly plastic; many roots; common medium and fine tubular pores; common fine basalt pebbles; slightly acid (pH 6.4 BTB); diffuse smooth boundary.

B21 17-29" Brown (10YR 5/3) heavy silt loam, brown (10YR 4/3) moist; strong medium, angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; common roots; common medium and fine tubular pores; common fine basalt pebbles; slightly acid (pH 6.5 BTB); gradual smooth boundary.

B22 29-38" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; strong medium angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, slightly plastic; common roots; common medium and fine tubular pores; neutral (pH 6.8 BTB); few concretions and flakes of manganese; common basalt stones; abrupt wavy boundary.

IIB23t 38-42" Brown (10YR 5/3) silt clay, brown (10YR 4/3) moist; strong medium prismatic structure; extremely hard; very firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; ped surfaces strong effervescence, center of prisms noneffervescent; neutral (pH 7.0 BTB); common pebbles weathered basalt; common pressure faces; thin continuous clay films; common concretions and flakes of manganese; clear irregular boundary.

IIB24ca 42-54" Brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; moderate medium prismatic structure; extremely hard; very firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; weak to strong effervescence; secondary carbonates as veins on ped surfaces; moderately alkaline (pH 8.4 TB); many concretions and flakes of manganese; moderate patchy clay films; common pressure faces; gradual wavy boundary.

IIB31ca 54-67" Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak medium prismatic structure; very hard; friable; sticky, plastic; few roots; common medium and fine tubular pores; slight to strong effervescence; secondary carbonates as veins and coatings on ped surfaces; strongly alkaline (pH 8.8 TB); common concretions and flakes of manganese; common weathered basalt pebbles and stones; diffuse smooth boundary.

IIB32ca 67-77" Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; massive; hard; friable; sticky, plastic; few roots; common medium and fine tubular pores; strong effervescence; secondary carbonates as veins; strongly alkaline (pH 8.6 TB); many concretions and flakes of manganese; common weathered basalt pebbles and stones; diffuse smooth boundary.

IIICca 77-94" (Taken with soil auger) Brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; massive; soft; friable; slightly sticky, slightly plastic; 25 percent basalt pebbles (cinders); strong effervescence; strongly alkaline (pH 8.6 TB).

IVR 94" Basalt.

IDAHO 6-60

Precip: 12-14"
Elevation: 5010'
Slope: S SW 4%

TOTAL ANNUAL YIELDS 1960-1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses				
Festuca idahoensis	349	37	172	25
Koeleria cristata	61	7	50	7
Poa secunda	73	8	44	7
Agropyron spicatum	50	5	56	8
Stipa columbiana	43	5	47	7
Elymus cinereus	3	T	-	-
Carex filifolia	21	2	24	4
Forbs				
Astragalus filipes	44	5	20	3
Crepis acuminata	22	2	11	2
Lupinus leucophyllus	23	3	7	1
Lomatium triternatum	12	1	13	2
Calochortus nitidus	11	1	9	1
Allium acuminatum	4	T	9	1
Other Forbs 1/	25	3	22	3
Annuals				
Bromus tectorum	2	T	2	T
Other Annuals 2/	3	T	2	T
Woody Plants				
Artemisia tripartita	182	19	179	26
Chrysothamnus viscidiflorus	21	2	20	3
Total Annual Yields	949	100	687	100
Total Estimated Litter	1717		1363	

1/ Other forbs include Agoseris glauca, Astragalus convallarius, Delphinium nelsoni, Eriogonum ovalifolium, Mertensia oblongifolia, Microseris nutans, Phlox longifolia and Senecio integerrimus.

2/ Other annuals include Collinsia parviflora, Collomia tenella, Cordylanthus ramosus, Gayophytum racemosum and Microsteris gracilis.

11/7/69 V.K.H.

HOELZLE SILT LOAM, DEEP VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 17-58 LABORATORY NO: S-58 Idaho 7-17

ELEVATION: 5065' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Near the center of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the east center of Sec. 19, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent south-facing slope.

CLASSIFICATION: Hoelzle silt loam, deep variant, a member of the fine, montmorillonitic, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and basaltic ash and cinders.

REMARKS: The bare surface soil, 0-2 inches, cracks upon drying. Cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Color of bare surface soil is slightly lighter than surface soil under vegetation. This pedon is similar to the Hoelzle series except it is deeper than 40 inches to bedrock. This pedon is characterized by a slightly acid mollic epipedon, mildly alkaline, silty clay argillic horizon and a moderately alkaline silty clay calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11 0-5" (Under grass) Dark grayish brown (10YR 4/2) silt loam, dark brown (10YR 3/3) moist; weak fine platy structure; soft; friable; nonsticky, nonplastic; many roots; many fine interstitial pores; slightly acid (pH 6.3); clear wavy boundary.

A12 5-15" Dark brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; slightly acid (pH 6.4); gradual smooth boundary.

B1 15-23" Brown (10YR 5/3) heavy loam, dark brown (10YR 4/3) moist; moderate medium and fine angular and subangular blocky structure; extremely hard; very firm; sticky, plastic; common roots; common medium and fine tubular pores; slightly acid (pH 6.4); soil peds thinly coated with bleached sand and silt; common slightly weathered basalt pebbles produce faint yellowish red (5YR 5/3) mottles; abrupt wavy boundary.

IIB21t 23-34" Brown (10YR 5/3) silty clay, dark brown (10YR 4/3) moist; moderate medium and coarse prismatic breaking to strong medium and fine angular blocky structure; extremely hard; very firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; thin continuous clay films; slight organic staining on prisms; common pressure faces; few flakes and concretions of manganese; common weathered basalt pebbles producing fine distinct yellowish red (5YR 5/6) mottles; mildly alkaline (pH 7.4); gradual smooth boundary.

IIB22t 34-44" Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate medium prismatic breaking to strong medium and fine angular blocky structure; extremely hard; firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; thin continuous clay films; few pressure faces; calcium carbonate as fine veins on prism faces, inner part of prisms are noneffervescent; few flakes and concretions of manganese; common weathered basalt pebbles producing fine distinct yellowish red (5YR 5/6) mottles; moderately alkaline (pH 8.0); gradual smooth boundary.

IIB23ca 44-57" Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate medium prismatic breaking to strong medium and fine angular blocky structure; extremely hard; firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; strong effervescence; secondary carbonate occurring as veins; thin patchy clay films; few pressure faces; few flakes and concretions of manganese, common weathered basalt pebbles producing yellowish red (5YR 5/6) mottles; moderately alkaline (pH 8.0); gradual smooth boundary.

IIB3ca 57-68" Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; weak medium prismatic breaking to moderate medium and fine angular and subangular blocky structure; very hard; friable; sticky, plastic; few roots between soil peds; common medium and fine tubular pores; strong effervescence; secondary carbonate occurring as coarse veins and soft pockets; many basalt pebbles; moderately alkaline (pH 8.2); gradual smooth boundary.

The following soil horizons are only approximate as they were determined with the soil auger.

IIC1ca 68-79" Very pale brown (10YR 7/3) silty clay loam, pale brown (10YR 6/3) moist; slightly hard; friable; slightly sticky, plastic; violent effervescence.

IIIC2ca 79-91" Very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; violent effervescence; containing thin lenses of moderately cemented materials that were difficult to cut through with the soil auger.

IIIC3ca 91-108" Very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3); violent effervescence; many basalt pebbles.

IVC4 108-118" Pale brown (10YR 6/3) gravelly silt loam, brown (10YR 5/3) moist; contains about 30 percent basalt gravel (cinders); violent effervescence.

VR 118" Basalt bedrock.

IDAHO 17-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20[1] Random Estimated Plots

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp
Grasses																		
Festuca idahoensis	651	60	394	51	544	53	236	36	467	30	242	28	205	38	448	43	243	48
Poa secunda & nevadensis	54	5	54	7	108	11	108	16	507	32	229	27	103	19	82	8	29	6
Agropyron spicatum	98	9	65	8	69	7	58	9	122	8	70	8	46	9	126	12	69	14
Sitanion hystrix	8	1	7	1	17	2	20	3	43	3	64	7	29	5	29	3	3	1
Elymus cinereus	13	1	8	1	4	T	4	1	13	1	4	T	2	T	2	T	-	-
Koeleria cristata	3	T	3	T	10	1	7	1	19	1	5	1	1	T	T	T	4	1
Forbs																		
Lupinus leucophyllus	50	4	29	4	45	4	7	1	31	2	31	4	12	2	8	1	6	1
Crepis occidentalis [2]	-	-	-	-	28	3	27	4	43	3	66	8	23	4	145	14	2	T
Phlox longifolia	13	1	13	2	20	2	16	2	25	2	16	2	9	2	23	2	19	4
Microseris nutans	-	-	-	-	19	2	15	2	15	1	23	3	-	-	-	-	-	-
Crepis acuminata	-	-	31	4	-	-	-	-	8	1	3	T	8	1	8	1	-	-
Allium acuminatum	4	-	5	1	3	T	4	T	23	1	4	T	1	T	22	2	-	-
Balsamorhiza sagittata	39	4	-	-	17	2	12	2	-	-	-	-	-	-	-	-	-	-
Lomatium triternatum	-	-	8	1	12	1	13	2	23	1	5	1	2	T	T	T	T	1
Other Forbs [3]	41	4	38	5	43	4	52	8	54	4	39	4	1	T	15	2	10	2
Annuals																		
Bromus tectorum	-	-	1	T	2	T	4	1	31	2	9	1	5	1	3	T	T	1
Other Annuals [4]	7	1	15	2	7	1	8	1	34	2	11	1	35	7	87	8	1	:
Woody Plants																		
Artemisia tridentata	53	5	75	10	56	5	53	8	61	4	12	1	-	-	15	2	48	1(
Artemisia tripartita	39	3	12	2	4	T	10	1	14	1	16	2	30	6	-	-	64	1:
Chrysothamnus viscidiflorus	7	1	11	1	17	2	9	1	20	1	12	1	23	4	13	1	-	
Chrysothamnus nauseosus	11	1	3	T	3	T	4	1	5	T	7	1	10	2	12	1	6	
Total Annual Yields	1091	100	772	100	1028	100	667	100	1558	100	868	100	545	100	1038	100	504	10
Total Estimated Litter [5]	2025		2027		1927		970		1076		1065		1131		1185		767	

1/ 10 plots estimated in 1958.
2/ Included in other forbs prior to 1960.
3/ Other forbs include Agoseris glauca, Antennaria stenophylla, Astragalus cibarius, Delphinium nelsoni, Fritillaria spp., Lactuca serriola, Merte ia, Ranunculus andersonii, Balsamorhiza sagittata, Cirsium spp., Lomatium triternatum, Senecio integerrimus.
4/ Other annuals include Collinsia parviflora, Collomia tenella and Cordylanthus ramosus.
5/ Total estimated litter, 1958, 1959 and 1960, includes humic mulch.

11/10/69 V.K.H.

CLEGG STONY LOAM, MODERATELY DEEP OVER BEDROCK VARIANT
(CUMULIC HAPLOXEROLL)

FIELD NO: Idaho 16-58 LABORATORY NO: S-58 Idaho 7-16

ELEVATION: 5105' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Near center of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the SW¼ of the NE¼, Sec. 19, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, sloping and rolling upland, 10 percent south-facing slope.

CLASSIFICATION: Clegg stony loam, moderately deep over bedrock variant, a member of the fine-loamy, mixed, frigid family of CUMULIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basaltic ash and cinders.

REMARKS: This pedon contains many stones, has weak structure, is mellow and can be easily spaded. It is similar to the Clegg series and has a deep mollic epipedon. It differs from the Clegg soils in that it does not have a calcic horizon and bedrock is within a depth of 40 inches.

Pedon is characterized by a deep mildly alkaline to neutral mollic epipedon and bedrock at a depth of less than 40 inches.

PEDON; Pedon is described under naturally disturbed vegetation. Color is for dry soil unless otherwise stated.

A11 0-3" Grayish brown (10YR 5/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak medium coarse platy structure; very soft to loose; very friable; nonsticky, slightly plastic; common roots; many interstitial pores; mildly alkaline (pH 7.4); abrupt smooth boundary.

A12 3-8" Brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; weak subangular blocky structure; soft; friable; slightly sticky, slightly plastic; many roots; many interstitial and few coarse tubular pores; neutral (pH 7.3); clear smooth boundary.

A13 8-18" Brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; soft; friable; slightly sticky, plastic; many roots; common medium and fine tubular pores; secondary carbonates on underside of stones but generally no effervescence; mildly alkaline (pH 7.6); abrupt irregular boundary.

C1ca 18-27" Dark brown (10YR 4/3) stony loam, dark brown (10YR 3/3) moist; massive; loose; very friable; slightly sticky, plastic; many roots; many interstitial pores; strong effervescence; basalt stones coated with secondary carbonates; moderately alkaline (pH 7.9); gradual wavy boundary.

C2ca 27-35" Grayish brown (10YR 5/2) stony loam, very dark grayish brown (10YR 3/2) moist; massive; loose; slightly sticky, plastic; common roots; many interstitial pores; strong effervescence; moderately alkaline (pH 7.9); contains approximately 50 percent basalt stones; abrupt irregular boundary.

IIR 35" Basalt bedrock.

IDAHO 16-58

Precip: 12-14"
Elevation: 5105'
Slope: S 10%

TOTAL ANNUAL YIELDS 1958 - 1961

Repeat Studies Based on 20 Random Estimated Plots 1/

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses								
Elymus cinereus	15	2	26	3	25	2	20	2
Poa secunda	18	2	7	1	10	1	14	1
Agropyron spicatum	-	-	1	T	4	T	2	T
Forbs								
Lomatium dissectum	450	47	513	52	511	50	395	37
Balsamorhiza sagittata	66	7	58	6	76	7	79	7
Machaeranthera canescens	8	1	3	T	5	T	5	1
Tragopogon dubius	4	T	-	-	6	1	4	T
Allium acuminatum	-	-	3	T	4	T	4	T
Other Forbs 2/	7	1	-	-	4	T	7	1
Annuals								
Bromus tectorum	42	5	99	10	99	10	210	20
Other Annuals 3/	14	1	23	2	46	4	23	2
Woody Plants								
Purshia tridentata	109	11	147	15	142	14	179	17
Artemisia tridentata	95	10	77	8	80	8	88	8
Chrysothamnus nauseosus	95	10	29	3	10	1	16	2
Chrysothamnus viscidiflorus	27	3	1	T	20	2	22	2
Total Annual Yields	950	100	987	100	1042	100	1068	100
Total Estimated Litter 4/	2200		1942		1942		1857	

1/ 10 plots estimated in 1958.
2/ Other forbs include Penstemon speciosus, Chaenactis douglasii, Lactuca serriola and Phlox longifolia.
3/ Other annuals include Chenopodium album, Collinsia parviflora, Collomia spp. and Gayophytum spp.
4/ Total estimated litter includes humic mulch.

11/7/69 V.K.H.

GOODINGTON SILT LOAM (ABRUPTIC PALEXEROLL)

FIELD NO: Idaho 18-58 LABORATORY NO: S-58 Idaho 7-18

ELEVATION: 5060' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Near the center of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the east center of Sec. 19, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W. It is about 100 feet northeast from study Idaho 17-58.

LAND FORM: Snake River Plain, nearly level and undulating upland, one percent southeast-facing slope.

CLASSIFICATION: Goodington silt loam, a member of the fine, montmorillonitic, frigid family of ABRUPTIC PALEXEROLLS.

PARENT MATERIAL: Eolian and residuum, mostly basaltic ash and cinders but the top 15 inches have been modified by loess.

REMARKS: This study consists of several small contiguous but isolated areas. It is intermingled with Hoelzle silt loam, deep variant. The bare soil surface, 0-2 inches, cracks upon drying and the cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores, and have weak thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation. Laboratory data show that the IIB21t horizon lacks 1.7 percent clay to qualify as an abruptic horizon. However, the A & B horizon sample consisted of a mixture of A2 and B2 soil materials and, therefore, this pedon was considered to have an abruptic argillic horizon. This pedon is characterized by a slightly acid to neutral mollic epipedon, a thin A2 horizon, a mildly alkaline, abruptic, argillic horizon and a calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and thin platy structure; soft; friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; few angular basalt pebbles; slightly acid (pH 6.5); clear smooth boundary.
A12	4-7"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; slightly acid (pH 6.5); clear smooth boundary.
A13	7-11"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; hard; friable; slightly sticky, slightly plastic; many roots; many medium and fine tubular pores; neutral (pH 6.6); few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; soil ped thinly coated with bleached sand and silt grains; gradual smooth boundary.
B & A	11-15"	Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure (PED is thickly coated with clean sand and silt, A2 tongues into the B2 horizon, light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) moist); extremely hard; firm; sticky, plastic; common roots; common medium and fine tubular pores; neutral (pH 6.6); few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; abrupt wavy boundary.
IIB21t	15-26"	Brown (10YR 5/3) silty clay, dark brown (10YR 3/3) moist; strong coarse columnar structure; extremely hard; very firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; few concretions of manganese; thin clay films and organic stains on vertical cleavage planes of columns; common pressure faces; mildly alkaline (pH 7.7); few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; clear wavy boundary.
IIB22t	26-34"	Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; strong medium and coarse prismatic structure; extremely hard; firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; slight to strong effervescence; secondary carbonates as fine veins, centers of peds weakly to noneffervescent; patchy clay films; common pressure faces; few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; few concretions of manganese; moderately alkaline (pH 8.1); gradual smooth boundary.
IIB23ca	34-45"	Pale brown (10YR 6/3) silty clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure; very hard; firm; very sticky, very plastic; few roots between soil peds; common fine tubular pores; strong effervescence; secondary carbonates occurring as coarse veins and soft pockets; moderately alkaline (pH 8.0); thin patchy clay films; common pressure faces; gradual smooth boundary.
IIB3ca	45-56"	Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate medium prismatic structure; very hard; firm; sticky, very plastic; few roots between peds; few fine tubular pores; violent effervescence; secondary carbonates as coarse veins and soft pockets; moderately alkaline (pH 8.0); few pressure faces; clear irregular boundary.
IIIC1ca	56-67"	White (10YR 8/2) silty clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; nonsticky, slightly plastic; few roots; many medium and fine tubular pores; violent effervescence; weakly cemented in places; moderately alkaline (pH 7.9); many basalt stones; clear irregular boundary.
IIIC2ca	67-84"	Very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; massive; loose; very friable; nonsticky, nonplastic; few roots; strong effervescence; 30 percent gravel; contains thin carbonate cemented lenses; moderately alkaline (pH 8.0); clear wavy boundary.
IIIC3	84-96"	Light brown (7.5YR 6/4) stony gravelly loam, brown (7.5YR 5/4) moist; massive; hard; strong effervescence; carbonates as veins; moderately alkaline (pH 8.0); 35 percent stones and gravel; abrupt wavy boundary.
IVR	96"	Basalt bedrock.

IDAHO 18-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20 Random Estimated Plots[1/]

Precip: 15-17"
Elevation: 5060'
Slope: SE 1%

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp
Grasses																				
Festuca idahoensis	166	29	130	25	193	29	92	19	199	17	108	10	173	29	239	27	89	38	277	30
Poa secunda	68	12	58	11	99	15	58	12	322	28	260	26	115	19	145	16	37	15	83	9
Sitanion hystrix	77	13	37	7	52	8	45	10	114	10	197	20	81	13	117	13	27	12	90	10
Agropyron spicatum	33	6	49	10	45	7	36	7	83	7	78	8	60	10	100	11	15	6	60	6
Koeleria cristata	4	1	7	1	7	1	10	2	28	2	30	3	6	1	13	1	-	-	9	1
Stipa thurberiana	-	-	-	-	2	T	4	1	16	1	10	1	-	-	6	1	-	-	68	8
Other Grasses[2/]	2	T	-	-	-	-	4	1	4	T	-	-	-	-	-	-	T	T	-	-
Forbs																				
Antennaria stenophylla	30	5	17	3	43	7	42	9	52	5	66	7	19	3	35	4	30	14	51	6
Crepis occidentalis	-	-	33	6	18	3	47	10	69	6	35	4	27	4	95	10	1	-	-	-
Phlox longifolia	18	3	26	5	22	3	26	5	47	4	55	6	16	3	10	1	12	5	48	5
Allium acuminatum	1	T	6	1	5	1	7	1	32	3	3	T	16	3	37	4	-	-	18	2
Astragalus cibarius	-	-	5	1	12	2	7	1	24	2	25	3	8	1	21	2	-	-	20	2
Senecio integerrimus	41	7	2	T	22	3	15	3	14	1	1	T	-	-	-	-	-	-	-	-
Other Forbs[3/]	25	4	74	14	83	12	53	11	94	8	80	8	15	3	28	3	4	1	37	4
Annuals																				
Bromus tectorum	-	-	T	T	T	T	-	-	10	1	7	1	1	T	2	T	1	T	4	T
Other Annuals[4/]	5	1	12	2	12	2	5	1	18	2	9	1	11	2	41	5	1	T	83	9
Woody Plants																				
Artemisia tridentata	28	5	33	6	27	4	19	4	23	2	10	1	10	2	-	-	14	6	60	6
Artemisia tripartita	36	6	22	4	13	2	8	2	2	T	2	T	-	-	-	-	5	2	8	1
Chrysothamnus viscidiflorus	16	3	15	3	9	1	7	1	6	1	10	1	35	6	21	2	-	-	11	1
Chrysothamnus nauseosus	27	5	4	1	-	-	1	T	3	T	4	T	5	1	-	-	3	1	-	-
Total Annual Yields	577	100	530	100	664	100	486	100	1160	100	990	100	598	100	910	100	239	100	927	100
Total Estimated Litter[5/]	1340		1150		965		569		727		780		1105		509		388		465	

1/ 10 plots estimated in 1958.
2/ Other grasses include Carex spp. and Melcia bulbosa.
3/ Other forbs include Agoseris glauca, Antennaria dimorpha, Balsamorhiza sagittata, Castilleja longispica, Cirsium spp., Crepis acuminata, Delphinium nelsoni, Eriogonum caespitosum, Eriogonum ovalifolium, Fritillaria pudica, Hymenoxys spp. Lactuca serriola, Lomatium triternatum, Lupinus leucophyllus, Mertensia oblongifolia, Microseris nutans and Viola beckwithii.
4/ Other annuals include Collinsia parviflora, Collomia tenella and Cordylanthus ramosus.
5/ Total estimated litter, 1958, 1959, and 1960, includes humic mulch.

11/7/69 V.K.H.

BANCROFT SILT LOAM, MODERATELY DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 9-59 LABORATORY NO: S-59 Idaho 7-9

ELEVATION: 5005' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Southeastern part of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the west center of Sec. 20, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, 2 percent east-facing slope.

CLASSIFICATION: Bancroft silt loam, moderately deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: Bare surface soil,0-2 inches deep, cracksupon drying. Cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak, thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation.

This soil differs from Bancroft series by having bedrock at a depth less than 40 inches.

This pedon is characterized by a slightly acid mollic epipedon, a neutral, argillic horizon and a moderately alkaline calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-2"	(Under grass) Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak fine platy structure; soft; friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; few angular basalt pebbles; medium acid (pH 5.7); clear smooth boundary.
A12	2-7"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; common angular basalt pebbles; slightly acid (pH 6.5); clear wavy boundary.
B2t	7-18"	Brown (10YR 5/3) heavy silt loam, brown (10YR 4/3) moist; weak prismatic breaking to strong medium angular, subangular, and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; many roots mostly between soil peds; common medium and fine tubular pores; common angular basalt pebbles; patchy clay films; neutral (pH 6.8); gradual smooth boundary.
Cca	18-36"	Light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; moderate medium subangular, angular and cylindrical blocky structure; common roots; common fine tubular pores; common angular basalt pebbles; violent effervescence; common carbonate; moderately alkaline (pH 7.9); abrupt wavy boundary.
IIR	36"	Basalt bedrock.

IDAHO 9-59

TOTAL ANNUAL YIELDS 1959 - 1968

Repeat Studies Based on 20 Random Estimated Plots

Precip: 14-16"
Elevation: 5005'
Slope: E 2%

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp	1968 Lbs. Acre	1968 % Comp
sses																				
estuca idahoensis	293	38	387	39	218	30	402	28	242	17	235	35	216	23	89	22	95	8	114	16
Agropyron spicatum	83	11	113	11	104	14	106	7	181	13	135	20	230	24	97	24	242	21	133	18
Poa secunda	46	6	86	9	53	7	229	16	222	16	55	8	50	5	10	2	24	2	36	5
Koeleria cristata	55	7	44	4	38	5	90	6	108	7	23	3	78	8	41	10	117	10	158	22
Agropyron riparium	10	1	17	2	7	1	16	1	28	2	2	T	-	-	-	-	26	2	4	1
Other grasses 1/	2	T	2	T	-	-	49	3	12	1	3	T	2	T	3	1	13	1	3	T
Forbs																				
Astragalus filipes	30	4	50	5	18	3	83	6	231	16	26	4	24	3	1	T	3	T	8	1
Crepis acuminata	41	5	63	6	43	6	82	6	27	2	16	2	48	5	6	1	80	7	15	2
Phlox longifolia	11	1	17	2	15	2	28	2	47	3	5	1	12	1	9	2	58	5	46	6
Lupinus leucophyllus	11	1	18	2	11	2	T	T	3	T	1	T	12	1	-	-	78	7	7	1
Lomatium triternatum	4	T	6	1	20	3	37	3	16	1	1	T	5	T	-	-	8	1	T	T
Microseris nutans	3	T	7	1	8	1	18	1	30	2	-	-	-	-	-	-	5	T	-	-
Other Forbs 2/	54	7	34	3	49	7	81	6	29	2	11	2	29	3	2	T	5	T	12	2
als																				
romus tectorum	2	T	-	-	2	T	6	T	25	2	18	3	48	5	1	T	46	4	8	1
Other Annuals 3/	5	1	4	T	3	T	8	1	15	1	2	T	24	3	-	-	32	3	1	T
Woody Plants																				
Artemisia tripartita	135	17	142	14	126	18	173	12	188	13	130	19	153	16	120	30	235	20	161	22
hrysothamnus viscidiflorus	5	1	6	1	10	1	24	2	24	2	10	2	28	3	33	8	97	9	19	3
Chrysothamnus nauseosus	-	-	-	-	-	-	-	-	-	-	5	1	-	-	-	-	-	-	-	-
Total Annual Yields	790	100	996	100	725	100	1432	100	1428	100	678	100	959	100	412	100	1164	100	725	100
Total Estimated Litter 4/	2385		1957		1312		1458		1042		1192		908		1133		834		890	

1/ Other grasses include Elymus cinereus, Poa nevadensis, Sitanion hystrix, Stipa thurberiana and Carex filifolia.
2/ Other forbs include Agoseris glauca, Allium acuminatum, Arnica sororia, Astragalus convallarius, Balsamorhiza sagittata, Calochortus nitidus, Eriogonum caespitosum, Eriogonum ovalifolium, Lactuca serriola, Mertensia oblongifolia, Phlox hoodii, Senecio integerrimus, and Tragopogon dubius.
3/ Other annuals include Collinsia parviflora, Collomia tenella and an unidentified mustard.
4/ Total estimated litter, 1959 and 1960, includes humic mulch.

11/7/69 V.K.H.

HONDOHO VERY STONY SILT LOAM, SHALLOW VARIANT (CALCIC HAPLOXEROLLS)

FIELD NO: Idaho 10-59 LABORATORY NO: S-59 Idaho 7-10

ELEVATION: 5020' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Southeastern part of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, from Carey, Blaine County, Idaho. It is in the SW¼ Sec. 20, T1S, R24E (BPM), approximately 43° 20' N. and 113° 32' W. It is on a low ridge and about 50 yards east of study Idaho 9-59.

LAND FORM: Snake River Plain, gently sloping and undulating upland, occupies a 2 percent east-facing slope.

CLASSIFICATION: Hondoho very stony silt loam, shallow variant, a member of the loamy-skeletal, mixed, frigid family of CALCIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: Bare surface soil, 0-2 inches, dries and cracks. Cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Local areas over shallow bedrock and containing basalt pebbles frequently form a polygonal pattern with segregated coarse particles. Stones occur throughout the soil and the bedrock contains deep crevices.

This pedon is similar to both the Hondoho and Eaglecone series. It differs from the Hondoho soils in having bedrock at a depth of less than 20 inches and from Eaglecone soils in having bedrock within 20 inches and containing more than 35 percent coarse fragments in the control section.

Pedon is characterized by a neutral, mollic epipedon, mildly alkaline cambic horizon and a calcic horizon. Bedrock, fractured and deeply creviced, occurs at a depth of 20 inches or less.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A1 0-5" (Under grass) Brown (10YR 5/3) very stony silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; contains approximately 25 percent basalt stones; neutral (pH 6.9); clear smooth boundary.

B2 5-11" Pale brown (10YR 6/3) very stony silt loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; contains approximately 25 percent basalt stones; mildly alkaline (pH 7.5); clear smooth boundary.

Cca 11-20" Light brownish gray (10YR 6/2) very stony loam, dark grayish brown (10YR 4/2) moist; moderate medium angular and subangular blocky structure; hard; friable; nonsticky, slightly plastic; common roots; common medium and fine tubular pores; strong effervescence; secondary carbonates as thin veins and disseminated; contains approximately 45 percent basalt stones; mildly alkaline (pH 7.8); abrupt irregular boundary.

IIR 20" Basalt (fractured, deeply creviced).

IDAHO 10-59

Precip: 14-16"
Elevation: 5020'
Slope: E 2%

TOTAL ANNUAL YIELDS 1959

Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp
Grasses		
Festuca idahoensis	144	18
Poa secunda	72	9
Agropyron spicatum	70	9
Koeleria cristata	26	3
Stipa thurberiana	25	3
Sitanion hystrix	5	1
Carex filifolia	20	2
Forbs		
Balsamorhiza sagittata	101	13
Astragalus filipes	13	2
Ranunculus glaberrimus	10	1
Mertensia oblongifolia	9	1
Crepis acuminata	7	1
Phlox longifolia	7	1
Other Forbs 1/	22	3
Annuals		
Bromus tectorum	1	T
Other Annuals 2/	6	1
Woody Plants		
Artemisia tridentata	133	17
Purshia tridentata	106	14
Chrysothamnus viscidiflorus	10	1
Total Annual Yields	787	100
Total Estimated Litter 3/	2130	

1/ Other forbs include Calochortus nitidus, Castilleja longispica, Erigeron canus, Eriogonum ovalifolium, Lomatium triternatum, Microseris nutan, Penstemon cusickii and Viola nuttallii var. vallicola.

2/ Other annuals include Cordylanthus ramosus, Orthocarpus luteus and Polygonum douglasii.

3/ Total estimated litter includes humic mulch.

11/7/69 V.K.H.

GOODINGTON LOAM, MODERATELY DEEP OVER BEDROCK VARIANT
(ABRUPTIC PALEXEROLL)

FIELD NO: Idaho 7-59 LABORATORY NO: S-59 Idaho 7-7

ELEVATION: 5020' NORMAL ANNUAL PRECIPITATION: 16" TEMPERATURE: 42° F.

LOCATION: Northeast side of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is near the center of Sec. 19, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, five percent southwest-facing slope.

CLASSIFICATION: Goodington loam, moderately deep over bedrock variant, a member of the fine, montmorillonitic, frigid family of ABRUPTIC PALEXEROLLS.

PARENT MATERIALS: Eolian and residuum, mostly basaltic ash and cinders but the top 14 inches have been modified by loess.

REMARKS: The bare surface soil, 0-2 inches, upon drying cracks and the cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation.

Laboratory data show this pedon lacks the 20 percent clay increase within the 3 inches of the argillic horizon to qualify as an abruptic horizon. However, the B & A horizon samples consists of a mixture of the A2 and B2 horizons and, therefore, this pedon, like Goodington silt loam, Ida. 18-58, was considered to have an abruptic argillic horizon.

Goodington loam, moderately deep over bedrock variant is characterized by a slightly acid to neutral, mollic epipedon, a thin A2 horizon, a mildly alkaline, abruptic argillic horizon and a carbonate horizon. It is very similar to the Goodington series except bedrock is encountered at a depth less than 40 inches.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; common basalt pebbles and cobbles; neutral (pH 6.7); clear wavy boundary.
A12	4-10"	Brown (10YR 5/3) heavy loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; slightly hard; friable; sticky, plastic; many roots; many fine tubular pores; common weathered basalt pebbles producing distinct reddish brown (5YR 5/3) mottles; slightly acid (pH 6.4); clear smooth boundary.
B & A	10-14"	Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; (PED thickly coated with clean sand and silt, A2 tongues into the B2 horizon, pale brown (10YR 6/3) and dark brown (10YR 4/3) moist); very hard; firm; sticky, plastic; common roots between soil peds; many fine tubular pores; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; neutral (pH 6.7); abrupt boundary.
IIB21t	14-23"	Brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; strong medium and coarse columnar structure; extremely hard; very firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; thin continuous clay films; slight organic staining on vertical cleavage planes of columns; common pressure faces; few manganese concretions; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; mildly alkaline (pH 7.6); clear irregular boundary.
IIB22t	23-30"	Brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to strong medium and fine angular blocky structure; extremely hard; firm, very sticky, very plastic; few roots between soil peds; few fine tubular pores; thin continuous clay films; common pressure faces; few manganese concretions; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; mildly alkaline (pH 7/6); clear irregular boundary.
IIB3ca	30-35"	Pale brown (10YR 6/3) clay, dark brown (10YR 4/3) moist; weak prismatic breaking to moderate fine angular blocky structure; very hard; friable; sticky, very plastic; few roots between soil peds; few fine tubular pores; thin patchy clay films; strong effervescence; secondary carbonates as fine veins, center of prisms in the upper part of this horizon noncalcareous; moderately alkaline (pH 7.9); common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 6/5 and 5/4) mottles; abrupt wavy boundary.
IIIR	35"	Basalt bedrock.

IDAHO 7-59

Precip: 14-16"
Elevation: 5020'
Slope: SW 5%

TOTAL ANNUAL YIELDS 1959 - 1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses						
Poa secunda	44	10	115	23	38	11
Festuca idahoensis	37	8	55	11	29	8
Stipa thurberiana	43	10	36	7	32	9
Sitanion hystrix	24	6	34	7	20	6
Koeleria cristata	4	1	8	2	5	1
Agropyron spicatum	4	1	4	1	6	1
Carex filifolia	1	T	-	-	-	-
Forbs						
Antennaria stenophylla	106	24	61	12	43	12
Phlox hoodii	40	9	32	7	23	7
Erigeron canus	33	8	24	5	25	7
Ranunculus andersonii	14	3	16	3	19	5
Mertensia oblongifolia	6	1	7	1	4	1
Other Forbs 1/	22	5	12	3	22	6
Annuals						
Bromus tectorum	-	-	T	T	-	-
Other Annuals 2/	T	T	1	T	-	-
Woody Plants						
Artemisia longiloba	64	14	90	18	93	26
Total Annual Yields	442	100	495	100	359	100
Total Estimated Litter 3/	710		810		272	

1/ Other forbs include Agoseris glauca, Allium acuminatum, Antennaria dimorpha, Astragalus scopulorum, Astragalus filipes, Castilleja longispica, Crepis occidentalis, Microseris nutans, Phlox longifolia, Senecio integerrimus, and Viola beckwithii.

2/ Other annuals include Polygonum douglasii

3/ Total estimated litter for 1959 and 1960 includes humic mulch.

11/7/69 V.K.H.

CLEGG SILT LOAM (CALCIC PACHIC ARGIXEROLL)

FIELD NO: Idaho 8-59 LABORATORY NO: S-59 Idaho 7-8

ELEVATION: 5080' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: North side of Carey Kipuka, Craters of the Moon National Monument, 26 miles east, via road, from Carey, Blaine County, Idaho. It is in the NW¼ of the NE¼, Sec. 19, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, hilly upland, 19 percent north-facing slope.

CLASSIFICATION: Clegg silt loam, a member of the fine-loamy, mixed, frigid family of CALCIC PACHIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basaltic ash and cinders.

REMARKS: The bare surface soil between plants cracks upon drying. Cracks, 0-2 inches deep, form a prominent polygonal surface pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation. Pedon is characterized by a neutral deep mollic epipedon, a neutral argillic horizon and a moderately alkaline calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11 0-4" (Under grass) Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; many roots; many interstitial pores; common angular basalt pebbles and cobbles; neutral (pH 6.6); clear smooth boundary

A12 4-10" Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; common medium and fine tubular pores; common angular basalt pebbles and cobbles; neutral (pH 6.6); clear smooth boundary.

B21t 10-22" Brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to moderate medium and fine angular and subangular blocky structure; extremely hard; firm; sticky, plastic; common roots; common medium and fine tubular pores; thin patchy clay films; common weathered basalt pebbles and cobbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; neutral (pH 6.7); gradual smooth boundary.

B22t 22-32" Brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to moderate medium and fine angular and subangular blocky structure; extremely hard; firm; sticky, plastic; few roots between soil peds; common fine tubular pores; thin patchy clay films; slight organic staining on prism faces; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; neutral (pH 7.1); gradual wavy boundary.

B3 32-38" Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium prismatic breaking to moderate medium and fine subangular and angular blocky structure; hard; friable; sticky, plastic; few roots; many fine tubular pores; few thin patchy clay films; many angular basalt pebbles and few cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary.

C1ca 38-57" Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft; friable; nonsticky, slightly plastic; few roots; many medium and fine tubular pores; many basalt pebbles and few cobbles; strong effervescence; common krotovina; moderately alkaline (pH 8.3); clear irregular boundary.

C2 57-72" Pale brown (10YR 6/3) angular gravelly silt loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; hard; friable; nonsticky, nonplastic; many fine tubular pores; few basalt pebbles; strong effervescence; secondary carbonates as thin veins; strongly alkaline (pH 8.8); common krotovina.

This horizon was determined by soil auger to extend to 15½ feet increasing slightly in cindery material with depth. Soil temperature on September 13, 1959, at 15½ feet, was 49.5° F. Temperature reading taken with Taylor maximum and minimum thermometer lowered to the bottom of the auger hole.

IDAHO 8-59

TOTAL ANNUAL YIELDS 1959 - 1968

Repeat Studies Based on 20 Random Estimated Plots

Precip: 12-14"
Elevation: 5080'
Slope: N 19%

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp	1968 Lbs. Acre	1968 % Comp
Grasses																				
Festuca idahoensis	297	46	369	42	255	37	369	26	300	28	330	40	317	35	300	42	394	34	385	50
Agropyron spicatum	101	16	111	12	84	12	191	13	149	14	202	25	245	27	240	33	293	25	198	25
Poa secunda	92	14	164	18	73	11	570	39	309	29	107	13	142	16	48	7	78	7	46	6
Koeleria cristata	28	4	30	3	29	4	32	2	63	6	33	4	16	2	48	7	51	4	40	5
Elymus cinereus	6	1	16	2	12	2	21	1	6	T	-	-	1	T	1	T	-	-	1	T
Poa nevadensis	-	-	-	-	13	2	47	3	-	-	-	-	-	-	-	-	-	-	-	-
Forbs																				
Crepis acuminata	42	7	55	6	54	8	61	4	110	10	83	10	96	11	45	6	129	11	21	3
Phlox longifolia	9	1	15	2	15	2	11	1	15	1	3	T	6	1	3	T	24	2	4	1
Lomatium triternatum	8	1	5	T	15	2	22	2	13	1	2	T	9	1	-	-	19	2	1	T
Mertensia oblongifolia	7	1	16	2	12	2	17	1	16	2	1	T	T	T	-	-	-	-	-	-
Allium acuminatum	1	T	4	T	17	2	13	1	3	T	1	T	9	1	-	-	4	T	-	-
Astragalus filipes	5	1	14	2	8	1	-	-	16	2	T	T	-	-	-	-	5	T	1	-
Other Forbs 1/	13	2	44	5	45	7	47	3	33	3	4	1	20	2	T	T	12	1	3	T
Annuals																				
Bromus tectorum	T	T	10	1	12	2	12	1	10	1	33	4	31	3	8	1	31	3	6	1
Other Annuals 2/	3	T	6	1	9	1	5	T	11	1	-	-	3	T	-	-	40	4	2	T
Woody Plants																				
Chrysothamnus viscidiflorus	15	2	15	2	7	1	17	1	15	1	27	3	11	1	26	4	54	5	70	9
Artemisia tripartita	18	3	19	2	13	2	18	1	8	1	-	-	T	T	-	-	-	-	-	-
Artemisia tridentata	-	-	5	T	6	1	7	1	-	-	-	-	T	T	-	-	20	2	-	-
Chrysothamnus nauseosus	3	1	5	T	5	1	3	T	-	-	-	-	-	-	-	-	-	-	-	-
Purshia tridentata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	T
Total Annual Yields	648	100	903	100	684	100	1463	100	1077	100	826	100	906	100	719	100	1154	100	779	100
Total Estimated Litter 3/	2182		1932		1138		1307		1320		1138		1478		1236		1041		1002	

1/ Other forbs include Agoseris glauca, Balsamorhiza sagittata, Calochortus nitidus, Crepis occidentalis, Delphinium nelsoni, Fritillaria lanceolata, Lupinus leucophyllus, Ranunculus glaberrimus, Senecio integerrimus.

2/ Other annuals include Collinsia parviflora and Mimulus nanus.

3/ Total estimated litter, 1959 and 1960, includes humic mulch.

This report & data obtained from BLM-Shoshone Library - black 3 ring binder labeled Carey K. Parker Soils

B
48
Continued

APPENDIX 6

MONITORING OF THE 1976-1977 ECOLOGICAL SITE VEGETATION INVENTORY

BACKGROUND

During the early spring of 1976 a decision was made by the Idaho State Director to use Soil Conservation Service (SCS) inventory procedures to gather soils and vegetation data for the Shoshone Grazing Environmental Statement (ES). It was felt that the SCS ecological site concept, combined with a third order soil survey, would provide a meaningful estimate of present and potential productivity in the time frame needed. Soil scientists from SCS and BLM teamed with range specialists from both agencies to identify and describe the ecological sites which occur in the Shoshone ES Area. See Appendix 3, Table A3-1, for a listing of the ecological sites.

Intensive vegetation sampling, using estimation and clipping to determine production by plant species, occurred at 126 sample sites. The entire ES Area was mapped using SCS vegetation condition class criteria. An excellent description of the soils and associated native vegetation was made on about one-half of the sample locations. The remaining sample points occurred on ecologically poor areas where data was needed to reduce excessive stocking or to solve some other specific problem. The overall result was a sample of most of the existing vegetation types which occur within the Shoshone ES Area.

During the fall and early winter of 1976 the vegetation data were analyzed and categorized. Criteria for allocation of palatable species for livestock and wildlife were developed.

After careful review of all available data, the decision was made in April 1977 to increase the vegetation inventory base to ensure that all the major vegetation types were sampled. Unfortunately, the drought had such a profound impact on production that much of the 1977 production data collected at the lower elevations could not be used for allocation of forage and determination of stocking rate. Nor could the Shoshone District confidently use ES-wide adjustment factors to correct the drought year production samples because the drought impact varied greatly depending on the ecological site, condition class, and present vegetation type. The data did serve to document production and/or the lack thereof in a severe drought situation. It also demonstrated an important concept: the lower condition classes were much more severely affected than were the upper fair to excellent condition classes.

TABLE A6-1

PRECIPITATION SUMMARY FOR SELECTED WEATHER STATIONS
FOUR YEARS AND NORMAL

Reporting Station and Year	Water Year		Entire Year	
	October 1 to June 30	Normal 1/	October 1 to September 30	Normal 1/
Bliss		8.40		9.11
1975-76	9.21		12.51	
1976-77	2.74		4.18	
1977-78	11.23		14.94	
1978-79	5.94 3/		6/	
Craters of the Moon		2/		2/
1975-76	12.51		15.38	
1976-77	7.39		9.99	
1977-78	16.29		19.07	
1978-79	5.27 5/		6/	
Hailey Ranger Station		14.81		16.41
1975-76	10.28		15.06	
1976-77	6.15		9.11	
1977-78	19.42		22.62	
1978-79	8.92 3/		6/	
Hill City		14.33		15.19
1975-76	9.93		13.83	
1976-77	4.81		6.82	
1977-78	14.80		18.21	
1978-79	7.30 4/		6/	
Picabo		2/		2/
1975-76	11.41		13,86	
1976-77	5.58		7.09	
1977-78	12.98		15.45	
1978-79	6.73 3/		6/	
Richfield		9.72		10.81
1975-76	10.48		13.02	
1976-77	3.45		4.94	
1977-78	12.25		14.70	
1978-79	6.07 3/		6/	
Shoshone		9.47		10.41
1975-76	8.52		11.78	
1976-77	2.40		3.99	
1977-78	11.36		13.84	
1978-79	4.72		6/	

Data Source: Climatological Data, National Oceanic and Atmospheric Adminstration, a printout.

1/ Normals are climatological standard normals based on the period 1941-1979.
2/ No long-term normal has been recorded.
3/ These values represent October 30, 1978 to May 31, 1979. Precipitation data for June 1979 were not available at the time of writing.
4/ Precipitation data were not available for April and June 1979.
5/ Precipitation data were not available for March and June 1979.
6/ Reports for June through September 1979 were not available.

At many of the reporting stations temperatures were warmer than average at the beginning of the growth season and cooler toward the end of the season. This gave the plants an added opportunity to take advantage of the moisture situation in 1976. Based on these data, the conclusion was reached that 1976 fell within the range of being a normal production year. Temperature data are on file at the Shoshone District Office.

Table A6-1 also shows precipitation for 1977, 1978, and 1979. Precipitation for the 1977 water year and entire year was far below normal. All stations with long-term averages reported well above-average moisture in 1978. Although all the data are not yet available for 1979, the precipitation for both the water year and entire year will be below the long-term normal.

Evaporation and Water Balance

Normal production during 1976 was also suggested by an analysis of calculated actual and potential evapotranspiration and the determination of water balance. This analysis takes into account the input of precipitation into the soil matrix and the output through evapotranspiration. The analysis, as described by Arkley and Ulrich (1962), is on file at the Shoshone District Office.

In 1976, moisture did not become a limiting factor for plant growth until June. Therefore, because April and May 1976 temperatures were warmer than normal, greater evapotranspiration and plant growth occurred. In other words, the plants were able to take advantage of sufficient 1976 moisture because of a favorable temperature regime.

Adequate soil moisture for average or greater plant growth is indicated by the field notes taken in April and May 1976 by SCS soil scientists. Practically all the soil pits had either field capacity or a saturated condition throughout that part of the soil profile in which the vast majority of plant roots occur (see Table A6-2). A saturated soil can hold no more water. A soil at field capacity has all the moisture the profile can hold after several days of drainage. Soil pits examined in late June and July 1976 showed the drying effect of evapotranspiration. Those examined in October 1976 had moisture at depth but were dry in the upper soil profile.

Resampling Vegetation

Thirty-two 1976 sample locations were selected for resample. One was at the Shoshone Kipuka and five were at the Carey Kipuka. (A Kipuka is an area of native vegetation protected from grazing by surrounding rough lava rock.) The other 26 sample locations were selected because they were representative of ecological

TABLE A6-2

1976 SOIL MOISTURE CONDITIONS AT SOIL PITS
EXAMINED BY SCS SOIL SCIENTISTS

Stop Number	Date	Location	Soil Series	Soil Moisture
76-1	4/5/76	SW¼SE¼, S29, T4S, R15E	Power SiL 1/	Moist to 24"
76-2	4/5/76	1550'W, & 1150'N of SE Cor. S29, SW¼SE¼, S29, T4S, R15E	Power SiL	0-29" FC 2/ 29" below FC
76-4	4/6/76	SW¼NE¼, S8, T4S, R13E	Yuitrue clay	FC to 36"
76-5	4/6/76	100'E of rd. 150'N of cattle-guard NW¼SE¼, S20, T4S, R13E	Power SiL	FC 0-3"
76-8	4/6/76	NW¼NE¼, S13, T5S, R12E	Purdam	To 38"
76-9	4/7/76	SE¼NW¼, S16, T4S, R11E	Power	To pan
76-10	4/7/76	SE¼NW¼, S16, T4S, R11E	Catchell SiL	FC 0-24"
BLM-11	4/8/76	NE¼NW¼, S11, T4S, R17E 125' E of road	Purdam	To bedrock
BLM-12	4/8/76	NW¼NW¼, S11, T4S, R17E	Gooding SiL	To bedrock
BLM-14	4/16/76	NW¼NE¼, S20, T4S, R14E	McCain-like	FC 25-26"
BLM-16	4/21/76	S2 & S11, T3S, R19E	McQuarrie SiL	FC 0-16.5"
BLM-17	4/29/76	NE¼SW¼, S29, T3S, R13E	Yutrue	FC 0-3"-50% FC 30-47"
76-19	4/30/76	SW¼NW¼, S20, T4S, R14E	Catchell SiL	FC 0-27"
21	5/3/76	NW¼, S7, T3S, R15E	Gaib	Saturated
22	5/3/76	SE¼SW¼, S1, T3s, R15E	Goodington	FC 0-34"
23	5/5/76	SE¼NW¼, S34, T3S, R17E	Bailing SiL	FC 0-27"
BLM-24	5/5/76		Tollegate	FC 0-42"
BLM-25	5/5/76	SE¼NE¼, S32, T3S, R17E	Elmore loam	FC to 24"
BLM-26	4/21/76	10 Mi N of Marley SE¼NW¼, S29, T3S, R19E	Gooding SiL	FC 0-25"

TABLE A6-2 (Continued)

1976 SOIL MOISTURE CONDITIONS AT SOIL PITS
EXAMINED BY SCS SOIL SCIENTISTS

Stop Number	Date	Location	Soil Series	Soil Moisture
27	4/21/76	NW¼SE¼, S29, T3S, R19E	Power	FC 0-28"
BLM-32	5/7/76	SE¼SW¼, S14, T3S, R17E	Torney	FC 0-53"
BLM-33	5/10/76	S20, T4S, R17E	Power	FC 0-28"
BLM-35	5/10/76	NW¼NE¼, S29, T4S, R17E	Oppio	FC 0-32"
39	5/25/76	NW¼NE¼, S29, T3S, R12E	Karcal	FC 0-25"
42	5/27/76	SE¼SE¼, S11, T3S, R11E	Inclusion	Throughout 0-27"
49	6/3/76	435' N & 925' E of SW cor. of S11, T1S, R15E	Rand's loam	Down to 46+"
52	6/17/76	3260 So. 1620 W of NE cor. S15, T3S, R20E	Deerhorn	Nearly dry
53	6/17/76	NW¼SE¼, S15, T3S, R20E	Rehfield	75% FC to rock
56	6/18/76	NW¼NE¼, S13, T2S, R18E	Gooding	0-4 FC 4-10 nearly dry 10-67 FC
66	7/14/76	SW¼SE¼, S20, T3S, R13E	Karcal clay	Nearly dry
87	10/3/76	SW¼NW¼, SE¼, S22, T6S, R12E, 3 Mi W Hwy 30 about 125' N of RR tracks	Sinkranch-like Truesdale-like	Below 4"
90	10/4/76	SW¼NE¼SW¼SW¼, S23, T5S, R11E, along drainage N of Hwy 30, W of Bliss		Below 22"

1/ SiL - Silt Loam
2/ FC - Field Capacity, the amount of moisture a particular soil can hold after several days of drainage.

sites. A stratified random selection of samples was used. Resampling did not occur in 1977 because of the drought. It was accomplished during the summer of 1978 and 1979 using the same methods employed in 1976 (see Appendix 1, "Inventory Procedures," "Vegetation Sampling").

RESULTS AND CONCLUSIONS

The results of the 1978 and 1979 resamples, compared to 1976, are on file at the Shoshone District Office. Each sample comparison was individually evaluated.

No consistent pattern could be detected from comparison of individual resample locations. That result would be expected for at least two reasons. First, the resample was taken from a variety of ecological sites in different condition classes. Those diverse sites would be expected to respond differently to a given set of environmental factors, such as precipitation, temperature, and water balance, for 1978, a moist year, and 1979, a dry year. The response of different sites following an extremely dry year such as 1977 would be expected to deviate even more than following a normal year. This was expecially true in the lower condition classes of the Wyoming sagebrush ecological site group. In that instance annual grasses and forbs make up a significant portion of the total yearly production of herbage.

Second, the ecological site ten-plot sampling approach is designed to replicate a given stratum with more than one sample. For example, a single ten-plot sample taken in 1976 on one stratum (Wyoming sagebrush-Thurber's needlegrass ecological site in poor condition with a present vegetation type of Wyoming sagebrush-cheatgrass) cannot be compared meaningfully with a single ten-plot sample on the same stratum taken in 1978 or 1979 because of inherent sampling error. For that reason an average of two or more samples, a replicate, taken on a given stratum in 1976 was compared to the same replicate average taken in 1978 and 1979. By doing so, inherent sampling error was much reduced.

Table A6-3 shows a four-year comparison of production for palatable species on the Carey and Shoshone Kipukas, long-term production on the Carey Kipuka, and a comparison of Shoshone ES Area resamples combined with Kipuka resamples. The resample groupings are numbered from one to four. The numbers are used to reference the text to the table.

Resample groupings 1 and 2 show that total production in 1977 was far less than normal. The same would have been true of groupings 3 and 4 if resampling had been done. Production of palatable perennial vegetation varied much less drastically than production of annual vegetation, which was almost not measurable in 1977.

TABLE A6-3

SUMMARY COMPARISON OF PALATABLE HERBAGE PRODUCTION
FOUR YEARS AND LONG TERM

Resample Grouping by Number and Location	Production Year	Total Production of Palatable Species		Production of Perennial Palatable Species		Production of Annual Palatable Species	
		All Samples (Pounds)	Departure from 1976 (Percent)	All Samples (Pounds)	Departure from 1976 (Percent)	All Samples (Pounds)	Departure from 1976 (Percent)
1. Carey Kipuka (5 ten-plot resamples) 1/	1976	3591		3508		83	
	1977	700	-81%	698	-80%	2	-98%
	1978	2266	-37%	1709	-51%	557	+571
	1979	2610	-27%	2573	-27	37	-55
2. Carey Kipuka (4 ten-plot resamples) 2/	1976	3244		3184		60	
	1977	511	-84%	510	-84%	1	-98%
	1978	1772	-45	1275	-60	497	+728
	1979	1869	-42	1850	-42	19	-68
	20-Year Average	2261	-30	2177	-32	84	+40
3. Carey Kipuka & Shoshone Kipuka (6 ten-plot resamples) 3/	1976	3995		3839		156	
	1977	Shoshone Kipuka not resampled					
	1978	2670	-33%	2091	-46%	579	+271%
	1979	2856	-29	2764	-28	92	-41
4. Both Kipukas and Shoshone ES Area (32 ten-plot samples) 4/	1976	8841		7556		1285	
	1977	Shoshone Kipuka and Shoshone ES not resampled					
	1978	8751	+1%	5732	-24%	3019	+135%
	1979	9392	+6	7264	-4	2128	+66

1/ Of the five ten-plot resamples, four are long-term SCS studies, taken over by the Shoshone District; one is a long-term University of Idaho study conducted recently by Shoshone District staff by cooperative agreement. All were established in the late 1950s.

2/ These are the four SCS studies in 1/ above.

3/ These are the five studies in 1/ plus three years of sampling by the Shoshone District staff in the Shoshone Kipuka.

4/ These are the resamples of 3/ above plus the 26 ES Area resamples by the Shoshone District staff.

Total production in 1978, an above-average precipitation year (Table A6-1), was less than in 1976 in all resample groupings except grouping 4 which had approximately the same production. The production of palatable perennial herbage in 1978 was far less than in 1976. Annual production, by comparison, was far greater in 1978 than in 1976. That pattern would be expected. Despite a much better moisture year in 1978, the perennial plants were still suffering the consequences of the 1977 drought. Annuals, on the other hand, are extremely opportunistic and simply took advantage of the abundant 1978 moisture and reduced competition by weakened perennial plants.

Total production in 1979, a below-average moisture year, was down 27 to 30 percent from 1976 production on all resample groupings except grouping 4, which had approximately 6 percent greater production in 1979 than in 1976. The increase in grouping 4 is primarily attributable to the production of annuals. The production of palatable perennial herbage was down from 1976 in all resample groupings. Likewise, the three resample groupings on the Kipukas (groupings 1-3) had less annual production in 1979 than in 1976. These protected areas, in good or excellent condition, have a much lower percentage of the total vegetation as annuals than do the 26 ES Area resamples included in grouping 4. That grouping had considerably greater annual production in 1979 than in 1976. This occurred because most of the resamples in grouping 4 range from poor to fair condition. The more abundant annual plants in the lower condition classes were able to take advantage of available moisture in the upper few inches of the soil profile and thus had a competitive advantage over perennial plants even in a below-average moisture year.

Several conclusions were drawn from these data. First, 1976 was considered to be a normal or above normal production year. This conclusion was supported by a comparision of 1976 total production for the Carey Kipuka (Grouping 2) with the 20-year average. The production during the year of the inventory, 1976, was 43 percent greater than the long-term average.

Second, if initial stocking rates had been based on 1978 production instead of 1976 production they would be lower than proposed. This would result from decreased palatable perennial production (allocated at 60 percent) and increased annual production (only allocated at 20 percent).

Third, if initial stocking rates had been based on 1979 production instead of 1976 production they would not be more than a few percentage points higher than proposed for lower elevation ranges in poor condition. Stocking rates would be lower for fair or good condition ranges at higher elevations. This difference when averaged would produce about the same overall proposed stocking rate as the 1976 inventory.

11/10/69 V.K.H.

CLEGG STONY LOAM, MODERATELY DEEP OVER BEDROCK VARIANT
(CUMULIC HAPLOXEROLL)

FIELD NO: Idaho 16-58 LABORATORY NO: S-58 Idaho 7-16

ELEVATION: 5105' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

Hugie Passey stuff

LOCATION: Near center of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the SW¼ of the NE¼, Sec. 19, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, sloping and rolling upland, 10 percent south-facing slope.

CLASSIFICATION: Clegg stony loam, moderately deep over bedrock variant, a member of the fine-loamy, mixed, frigid family of CUMULIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basaltic ash and cinders.

REMARKS: This pedon contains many stones, has weak structure, is mellow and can be easily spaded. It is similar to the Clegg series and has a deep mollic epipedon. It differs from the Clegg soils in that it does not have a calcic horizon and bedrock is within a depth of 40 inches.

Pedon is characterized by a deep mildly alkaline to neutral mollic epipedon and bedrock at a depth of less than 40 inches.

PEDON; Pedon is described under naturally disturbed vegetation. Color is for dry soil unless otherwise stated.

A11	0-3"	Grayish brown (10YR 5/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak medium coarse platy structure; very soft to loose; very friable; nonsticky, slightly plastic; common roots; many interstitial pores; mildly alkaline (pH 7.4); abrupt smooth boundary.
A12	3-8"	Brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; weak subangular blocky structure; soft; friable; slightly sticky, slightly plastic; many roots; many interstitial and few coarse tubular pores; neutral (pH 7.3); clear smooth boundary.
A13	8-18"	Brown (10YR 5/3) stony loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; soft; friable; slightly sticky, plastic; many roots; common medium and fine tubular pores; secondary carbonates on underside of stones but generally no effervescence; mildly alkaline (pH 7.6); abrupt irregular boundary.
C1ca	18-27"	Dark brown (10YR 4/3) stony loam, dark brown (10YR 3/3) moist; massive; loose; very friable; slightly sticky, plastic; many roots; many interstitial pores; strong effervescence; basalt stones coated with secondary carbonates; moderately alkaline (pH 7.9); gradual wavy boundary.
C2ca	27-35"	Grayish brown (10YR 5/2) stony loam, very dark grayish brown (10YR 3/2) moist; massive; loose; slightly sticky, plastic; common roots; many interstitial pores; strong effervescence; moderately alkaline (pH 7.9); contains approximately 50 percent basalt stones; abrupt irregular boundary.
IIR	35"	Basalt bedrock.

IDAHO 16-58

TOTAL ANNUAL YIELDS 1958 - 1961

Precip: 12-14"
Elevation: 5105'
Slope: S 10%

Repeat Studies Based on 20 Random Estimated Plots 1/

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses								
Elymus cinereus	15	2	26	3	25	2	20	2
Poa secunda	18	2	7	1	10	1	14	1
Agropyron spicatum	-	-	1	T	4	T	2	T
Forbs								
Lomatium dissectum	450	47	513	52	511	50	395	37
Balsamorhiza sagittata	66	7	58	6	76	7	79	7
Machaeranthera canescens	8	1	3	T	5	T	5	1
Tragopogon dubius	4	T	-	-	6	1	4	T
Allium acuminatum	-	-	3	T	4	T	4	T
Other Forbs 2/	7	1	-	-	4	T	7	1
Annuals								
Bromus tectorum	42	5	99	10	99	10	210	20
Other Annuals 3/	14	1	23	2	46	4	23	2
Woody Plants								
Purshia tridentata	109	11	147	15	142	14	179	17
Artemisia tridentata	95	10	77	8	80	8	88	8
Chrysothamnus nauseosus	95	10	29	3	10	1	16	2
Chrysothamnus viscidiflorus	27	3	1	T	20	2	22	2
Total Annual Yields	950	100	987	100	1042	100	1068	100
Total Estimated Litter 4/	2200		1942		1942		1857	

1/ 10 plots estimated in 1958.
2/ Other forbs include Penstemon speciosus, Chaenactis douglasii, Lactuca serriola and Phlox longifolia.
3/ Other annuals include Chenopodium album, Collinsia parviflora, Collomia spp. and Gayophytum spp.
4/ Total estimated litter includes humic mulch.

GOODINGTON SILT LOAM (~~ABRUPTIC~~ Typic PALEXEROLL) 11/7/69 V.K.H.

FIELD NO: Idaho 18-58 LABORATORY NO: S-58 Idaho 7-18

ELEVATION: 5060' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Near the center of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the east center of Sec. 19, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W. It is about 100 feet northeast from study Idaho 17-58.

LAND FORM: Snake River Plain, nearly level and undulating upland, one percent southeast-facing slope.

CLASSIFICATION: Goodington silt loam, a member of the fine, montmorillonitic, frigid family of ~~ABRUPTIC~~ Typic PALEXEROLLS.

PARENT MATERIAL: Eolian and residuum, mostly basaltic ash and cinders but the top 15 inches have been modified by loess.

REMARKS: This study consists of several small contiguous but isolated areas. It is intermingled with Hoelzle silt loam, deep variant. The bare soil surface, 0-2 inches, cracks upon drying and the cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores, and have weak thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation. Laboratory data show that the IIB21t horizon lacks 1.7 percent clay to qualify as an abruptic horizon. However, the A & B horizon sample consisted of a mixture of A2 and B2 soil materials and, therefore, this pedon was considered to have an abruptic argillic horizon. This pedon is characterized by a slightly acid to neutral mollic epipedon, a thin A2 horizon, a mildly alkaline, abruptic, argillic horizon and a calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and thin platy structure; soft; friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; few angular basalt pebbles; slightly acid (pH 6.5); clear smooth boundary.
A12	4-7"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium platy structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; slightly acid (pH 6.5); clear smooth boundary.
A13	7-11"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; hard; friable; slightly sticky, slightly plastic; many roots; many medium and fine tubular pores; neutral (pH 6.6); few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; soil ped thinly coated with bleached sand and silt grains; gradual smooth boundary.
B & A	11-15"	Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure (PED is thickly coated with clean sand and silt, A2 tongues into the B2 horizon, light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) moist); extremely hard; firm; sticky, plastic; common roots; common medium and fine tubular pores; neutral (pH 6.6); few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; abrupt wavy boundary.
IIB21t	15-26"	Brown (10YR 5/3) silty clay, dark brown (10YR 3/3) moist; strong coarse columnar structure; extremely hard; very firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; few concretions of manganese; thin clay films and organic stains on vertical cleavage planes of columns; common pressure faces; mildly alkaline (pH 7.7); few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; clear wavy boundary.
IIB22t	26-34"	Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; strong medium and coarse prismatic structure; extremely hard; firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; slight to strong effervescence; secondary carbonates as fine veins, centers of peds weakly to noneffervescent; patchy clay films; common pressure faces; few weathered basalt pebbles producing distinct yellowish red (5YR 5/6) mottles; few concretions of manganese; moderately alkaline (pH 8.1); gradual smooth boundary.
IIB23ca	34-45"	Pale brown (10YR 6/3) silty clay, dark brown (10YR 4/3) moist; moderate medium prismatic structure; very hard; firm; very sticky, very plastic; few roots between soil peds; common fine tubular pores; strong effervescence; secondary carbonates occurring as coarse veins and soft pockets; moderately alkaline (pH 8.0); thin patchy clay films; common pressure faces; gradual smooth boundary.
IIB3ca	45-56"	Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate medium prismatic structure; very hard; firm; sticky, very plastic; few roots between peds; few fine tubular pores; violent effervescence; secondary carbonates as coarse veins and soft pockets; moderately alkaline (pH 8.0); few pressure faces; clear irregular boundary.
IIIC1ca	56-67"	White (10YR 8/2) silty clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; nonsticky, slightly plastic; few roots; many medium and fine tubular pores; violent effervescence; weakly cemented in places; moderately alkaline (pH 7.9); many basalt stones; clear irregular boundary.
IIIC2ca	67-84"	Very pale brown (10YR 7/3) gravelly loam, brown (10YR 5/3) moist; massive; loose; very friable; nonsticky, nonplastic; few roots; strong effervescence; 30 percent gravel; contains thin carbonate cemented lenses; moderately alkaline (pH 8.0); clear wavy boundary.
IIIC3	84-96"	Light brown (7.5YR 6/4) stony gravelly loam, brown (7.5YR 5/4) moist; massive; hard; strong effervescence; carbonates as veins; moderately alkaline (pH 8.0); 35 percent stones and gravel; abrupt wavy boundary.
IVR	96"	Basalt bedrock.

IDAHO 18-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20 Random Estimated Plots[1/]

Precip: 15-17"
Elevation: 5060'
Slope: SE 1%

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp
Grasses																				
Festuca idahoensis	166	29	130	25	193	29	92	19	199	17	108	10	173	29	239	27	89	38	277	30
Poa secunda	68	12	58	11	99	15	58	12	322	28	260	26	115	19	145	16	37	15	83	9
Sitanion hystrix	77	13	37	7	52	8	45	10	114	10	197	20	81	13	117	13	27	12	90	10
Agropyron spicatum	33	6	49	10	45	7	36	7	83	7	78	8	60	10	100	11	15	6	60	6
Koeleria cristata	4	1	7	1	7	1	10	2	28	2	30	3	6	1	13	1	-	-	9	1
Stipa thurberiana	-	-	-	-	2	T	4	1	16	1	10	1	-	-	6	1	-	-	68	8
Other Grasses[2/]	2	T	-	-	-	-	4	1	4	T	-	-	-	-	-	-	T	T	-	-
Forbs																				
Antennaria stenophylla	30	5	17	3	43	7	42	9	52	5	66	7	19	3	35	4	30	14	51	6
Crepis occidentalis	-	-	33	6	18	3	47	10	69	6	35	4	27	4	95	10	1	-	-	-
Phlox longifolia	18	3	26	5	22	3	26	5	47	4	55	6	16	3	10	1	12	5	48	5
Allium acuminatum	1	T	6	1	5	1	7	1	32	3	3	T	16	3	37	4	-	-	18	2
Astragalus cibarius	-	-	5	1	12	2	7	1	24	2	25	3	8	1	21	2	-	-	20	2
Senecio integerrimus	41	7	2	T	22	3	15	3	14	1	1	T	-	-	-	-	-	-	-	-
Other Forbs[3/]	25	4	74	14	83	12	53	11	94	8	80	8	15	3	28	3	4	1	37	4
Annuals																				
Bromus tectorum	-	-	T	T	T	T	-	-	10	1	7	1	1	T	2	T	1	T	4	T
Other Annuals[4/]	5	1	12	2	12	2	5	1	18	2	9	1	11	2	41	5	1	T	83	9
Woody Plants																				
Artemisia tridentata	28	5	33	6	27	4	19	4	23	2	10	1	10	2	-	-	14	6	60	6
Artemisia tripartita	36	6	22	4	13	2	8	2	2	T	2	T	-	-	-	-	5	2	8	1
Chrysothamnus viscidiflorus	16	3	15	3	9	1	7	1	6	1	10	1	35	6	21	2	-	-	11	1
Chrysothamnus nauseosus	27	5	4	1	-	-	1	T	3	T	4	T	5	1	-	-	3	1	-	-
Total Annual Yields	577	100	530	100	664	100	486	100	1160	100	990	100	598	100	910	100	239	100	927	100
Total Estimated Litter[5/]	1340		1150		965		569		727		780		1105		509		388		465	

1/ 10 plots estimated in 1958.
2/ Other grasses include Carex spp. and Melcia bulbosa.
3/ Other forbs include Agoseris glauca, Antennaria dimorpha, Balsamorhiza sagittata, Castilleja longispica, Cirsium spp., Crepis acuminata, Delphinium nelsoni, Eriogonum caespitosum, Eriogonum ovalifolium, Fritillaria pudica, Hymenoxys spp. Lactuca serriola, Lomatium triternatum, Lupinus leucophyllus, Mertensia oblongifolia, Microseris nutans and Viola beckwithii.
4/ Other annuals include Collinsia parviflora, Collomia tenella and Cordylanthus ramosus.
5/ Total estimated litter, 1958, 1959, and 1960, includes humic mulch.

11/7/69 V.K.H.

HOELZLE SILT LOAM, DEEP VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 17-58 LABORATORY NO: S-58 Idaho 7-17

ELEVATION: 5065' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Near the center of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the east center of Sec. 19, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent south-facing slope.

CLASSIFICATION: Hoelzle silt loam, deep variant, a member of the fine, montmorillonitic, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and basaltic ash and cinders.

REMARKS: The bare surface soil, 0-2 inches, cracks upon drying. Cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Color of bare surface soil is slightly lighter than surface soil under vegetation. This pedon is similar to the Hoelzle series except it is deeper than 40 inches to bedrock. This pedon is characterized by a slightly acid mollic epipedon, mildly alkaline, silty clay argillic horizon and a moderately alkaline silty clay calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11 0-5" (Under grass) Dark grayish brown (10YR 4/2) silt loam, dark brown (10YR 3/3) moist; weak fine platy structure; soft; friable; nonsticky, nonplastic; many roots; many fine interstitial pores; slightly acid (pH 6.3); clear wavy boundary.

A12 5-15" Dark brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; slightly acid (pH 6.4); gradual smooth boundary.

B1 15-23" Brown (10YR 5/3) heavy loam, dark brown (10YR 4/3) moist; moderate medium and fine angular and subangular blocky structure; extremely hard; very firm; sticky, plastic; common roots; common medium and fine tubular pores; slightly acid (pH 6.4); soil peds thinly coated with bleached sand and silt; common slightly weathered basalt pebbles produce faint yellowish red (5YR 5/3) mottles; abrupt wavy boundary.

IIB21t 23-34" Brown (10YR 5/3) silty clay, dark brown (10YR 4/3) moist; moderate medium and coarse prismatic breaking to strong medium and fine angular blocky structure; extremely hard; very firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; thin continuous clay films; slight organic staining on prisms; common pressure faces; few flakes and concretions of manganese; common weathered basalt pebbles producing fine distinct yellowish red (5YR 5/6) mottles; mildly alkaline (pH 7.4); gradual smooth boundary.

IIB22t 34-44" Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate medium prismatic breaking to strong medium and fine angular blocky structure; extremely hard; firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; thin continuous clay films; few pressure faces; calcium carbonate as fine veins on prism faces, inner part of prisms are noneffervescent; few flakes and concretions of manganese; common weathered basalt pebbles producing fine distinct yellowish red (5YR 5/6) mottles; moderately alkaline (pH 8.0); gradual smooth boundary.

IIB23ca 44-57" Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; moderate medium prismatic breaking to strong medium and fine angular blocky structure; extremely hard; firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; strong effervescence; secondary carbonate occurring as veins; thin patchy clay films; few pressure faces; few flakes and concretions of manganese, common weathered basalt pebbles producing yellowish red (5YR 5/6) mottles; moderately alkaline (pH 8.0); gradual smooth boundary.

IIB3ca 57-68" Pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; weak medium prismatic breaking to moderate medium and fine angular and subangular blocky structure; very hard; friable; sticky, plastic; few roots between soil peds; common medium and fine tubular pores; strong effervescence; secondary carbonate occurring as coarse veins and soft pockets; many basalt pebbles; moderately alkaline (pH 8.2); gradual smooth boundary.

The following soil horizons are only approximate as they were determined with the soil auger.

IIC1ca 68-79" Very pale brown (10YR 7/3) silty clay loam, pale brown (10YR 6/3) moist; slightly hard; friable; slightly sticky, plastic; violent effervescence.

IIIC2ca 79-91" Very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; violent effervescence; containing thin lenses of moderately cemented materials that were difficult to cut through with the soil auger.

IIIC3ca 91-108" Very pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3); violent effervescence; many basalt pebbles.

IVC4 108-118" Pale brown (10YR 6/3) gravelly silt loam, brown (10YR 5/3) moist; contains about 30 percent basalt gravel (cinders); violent effervescence.

VR 118" Basalt bedrock.

IDAHO 17-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20[1] Random Estimated Plots

Precip: 15-17"
Elevation: 5065'
Slope: S 1%

Species	1958		1959		1960		1961		1962		1963		1964		1965		1966		1967	
	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp	Lbs. Acre	% Comp
Grasses																				
Festuca idahoensis	651	60	394	51	544	53	236	36	467	30	242	28	205	38	448	43	243	48	411	23
Poa secunda & nevadensis	54	5	54	7	108	11	108	16	507	32	229	27	103	19	82	8	29	6	154	9
Agropyron spicatum	98	9	65	8	69	7	58	9	122	8	70	8	46	9	126	12	69	14	357	20
Sitanion hystrix	8	1	7	1	17	2	20	3	43	3	64	7	29	5	29	3	3	1	42	3
Elymus cinereus	13	1	8	1	4	T	4	1	13	1	4	T	2	T	2	T	-	-	22	1
Koeleria cristata	3	T	3	T	10	1	7	1	19	1	5	1	1	T	T	T	4	1	-	-
Forbs																				
Lupinus leucophyllus	50	4	29	4	45	4	7	1	31	2	31	4	12	2	8	1	6	1	212	12
Crepis occidentalis [2]	-	-	-	-	28	3	27	4	43	3	66	8	23	4	145	14	2	T	-	-
Phlox longifolia	13	1	13	2	20	2	16	2	25	2	16	2	9	2	23	2	19	4	42	3
Microseris nutans	-	-	-	-	19	2	15	2	15	1	23	3	-	-	-	-	-	-	30	2
Crepis acuminata	-	-	31	4	-	-	-	-	8	1	3	T	8	1	8	1	-	-	24	1
Allium acuminatum	4	-	5	1	3	T	4	T	23	1	4	T	1	T	22	2	-	-	7	T
Balsamorhiza sagittata	39	4	-	-	17	2	12	2	-	-	-	-	-	-	-	-	-	-	-	-
Lomatium triternatum	-	-	8	1	12	1	13	2	23	1	5	1	2	T	T	T	T	T	2	T
Other Forbs [3]	41	4	38	5	43	4	52	8	54	4	39	4	1	T	15	2	10	2	21	.
Annuals																				
Bromus tectorum	-	-	1	T	2	T	4	1	31	2	9	1	5	1	3	T	T	T	33	2
Other Annuals [4]	7	1	15	2	7	1	8	1	34	2	11	1	35	7	87	8	1	T	133	7
Woody Plants																				
Artemisia tridentata	53	5	75	10	56	5	53	8	61	4	12	1	-	-	15	2	48	10	239	13
Artemisia tripartita	39	3	12	2	4	T	10	1	14	1	16	2	30	6	-	-	64	12	-	-
Chrysothamnus viscidiflorus	7	1	11	1	17	2	9	1	20	1	12	1	23	4	13	1	-	-	44	3
Chrysothamnus nauseosus	11	1	3	T	3	T	4	1	5	T	7	1	10	2	12	1	6	1	6	T
Total Annual Yields	1091	100	772	100	1028	100	667	100	1558	100	868	100	545	100	1038	100	504	100	1779	100
Total Estimated Litter [5]	2025		2027		1927		970		1076		1065		1131		1185		767		1077	

1/ 10 plots estimated in 1958.
2/ Included in other forbs prior to 1960.
3/ Other forbs include Agoseris glauca, Antennaria stenophylla, Astragalus cibarius, Delphinium nelsoni, Fritillaria spp., Lactuca serriola, Mertensia oblongifolia, Ranunculus andersonii, Balsamorhiza sagittata, Cirsium spp., Lomatium triternatum, Senecio integerrimus.
4/ Other annuals include Collinsia parviflora, Collomia tenella and Cordylanthus ramosus.
5/ Total estimated litter, 1958, 1959 and 1960, includes humic mulch.

11/7/69 V.K.H.

GOODINGTON LOAM, MODERATELY DEEP OVER BEDROCK VARIANT
(~~ABRUPTIC~~ Typic PALEXEROLL)

FIELD NO: Idaho 7-59 LABORATORY NO: S-59 Idaho 7-7

ELEVATION: 5020' NORMAL ANNUAL PRECIPITATION: 16" TEMPERATURE: 42° F.

LOCATION: Northeast side of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is near the center of Sec. 19, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, five percent southwest-facing slope.

CLASSIFICATION: Goodington loam, moderately deep over bedrock variant, a member of the fine, montmorillonitic, frigid family of ~~ABRUPTIC~~ Typic PALEXEROLLS.

PARENT MATERIALS: Eolian and residuum, mostly basaltic ash and cinders but the top 14 inches have been modified by loess.

REMARKS: The bare surface soil, 0-2 inches, upon drying cracks and the cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation.

Laboratory data show this pedon lacks the 20 percent clay increase within the 3 inches of the argillic horizon to qualify as an abruptic horizon. However, the B & A horizon samples consists of a mixture of the A2 and B2 horizons and, therefore, this pedon, like Goodington silt loam, Ida. 18-58, was considered to have an abruptic argillic horizon.

Goodington loam, moderately deep over bedrock variant is characterized by a slightly acid to neutral, mollic epipedon, a thin A2 horizon, a mildly alkaline, abruptic argillic horizon and a carbonate horizon. It is very similar to the Goodington series except bedrock is encountered at a depth less than 40 inches.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; common basalt pebbles and cobbles; neutral (pH 6.7); clear wavy boundary.
A12	4-10"	Brown (10YR 5/3) heavy loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; slightly hard; friable; sticky, plastic; many roots; many fine tubular pores; common weathered basalt pebbles producing distinct reddish brown (5YR 5/3) mottles; slightly acid (pH 6.4); clear smooth boundary.
B & A	10-14"	Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; (PED thickly coated with clean sand and silt, A2 tongues into the B2 horizon, pale brown (10YR 6/3) and dark brown (10YR 4/3) moist); very hard; firm; sticky, plastic; common roots between soil peds; many fine tubular pores; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; neutral (pH 6.7); abrupt boundary.
IIB21t	14-23"	Brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; strong medium and coarse columnar structure; extremely hard; very firm; very sticky, very plastic; common roots between soil peds; few fine tubular pores; thin continuous clay films; slight organic staining on vertical cleavage planes of columns; common pressure faces; few manganese concretions; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; mildly alkaline (pH 7.6); clear irregular boundary.
IIB22t	23-30"	Brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to strong medium and fine angular blocky structure; extremely hard; firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; thin continuous clay films; common pressure faces; few manganese concretions; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; mildly alkaline (pH 7/6); clear irregular boundary.
IIB3ca	30-35"	Pale brown (10YR 6/3) clay, dark brown (10YR 4/3) moist; weak prismatic breaking to moderate fine angular blocky structure; very hard; friable; sticky, very plastic; few roots between soil peds; few fine tubular pores; thin patchy clay films; strong effervescence; secondary carbonates as fine veins, center of prisms in the upper part of this horizon noncalcareous; moderately alkaline (pH 7.9); common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 6/5 and 5/4) mottles; abrupt wavy boundary.
IIIR	35"	Basalt bedrock.

IDAHO 7-59

Precip: 14-16"
Elevation: 5020'
Slope: SW 5%

TOTAL ANNUAL YIELDS 1959 - 1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses						
Poa secunda	44	10	115	23	38	11
Festuca idahoensis	37	8	55	11	29	8
Stipa thurberiana	43	10	36	7	32	9
Sitanion hystrix	24	6	34	7	20	6
Koeleria cristata	4	1	8	2	5	1
Agropyron spicatum	4	1	4	1	6	1
Carex filifolia	1	T	-	-	-	-
Forbs						
Antennaria stenophylla	106	24	61	12	43	12
Phlox hoodii	40	9	32	7	23	7
Erigeron canus	33	8	24	5	25	7
Ranunculus andersonii	14	3	16	3	19	5
Mertensia oblongifolia	6	1	7	1	4	1
Other Forbs 1/	22	5	12	3	22	6
Annuals						
Bromus tectorum	-	-	T	T	-	-
Other Annuals 2/	T	T	1	T	-	-
Woody Plants						
Artemisia longiloba	64	14	90	18	93	26
Total Annual Yields	442	100	495	100	359	100
Total Estimated Litter 3/	710		810		272	

1/ Other forbs include Agoseris glauca, Allium acuminatum, Antennaria dimorpha, Astragalus scopulorum, Astragalus filipes, Castilleja longispica, Crepis occidentalis, Microseris nutans, Phlox longifolia, Senecio integerrimus, and Viola beckwithii.

2/ Other annuals include Polygonum douglasii

3/ Total estimated litter for 1959 and 1960 includes humic mulch.

11/7/69 V.K.H.

CLEGG SILT LOAM (CALCIC PACHIC ARGIXEROLL)

FIELD NO: Idaho 8-59 LABORATORY NO: S-59 Idaho 7-8

ELEVATION: 5080' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: North side of Carey Kipuka, Craters of the Moon National Monument, 26 miles east, via road, from Carey, Blaine County, Idaho. It is in the NW¼ of the NE¼, Sec. 19, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, hilly upland, 19 percent north-facing slope.

CLASSIFICATION: Clegg silt loam, a member of the fine-loamy, mixed, frigid family of CALCIC PACHIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basaltic ash and cinders.

REMARKS: The bare surface soil between plants cracks upon drying. Cracks, 0-2 inches deep, form a prominent polygonal surface pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation. Pedon is characterized by a neutral deep mollic epipedon, a neutral argillic horizon and a moderately alkaline calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; many roots; many interstitial pores; common angular basalt pebbles and cobbles; neutral (pH 6.6); clear smooth boundary
A12	4-10"	Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; common medium and fine tubular pores; common angular basalt pebbles and cobbles; neutral (pH 6.6); clear smooth boundary.
B21t	10-22"	Brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to moderate medium and fine angular and subangular blocky structure; extremely hard; firm; sticky, plastic; common roots; common medium and fine tubular pores; thin patchy clay films; common weathered basalt pebbles and cobbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; neutral (pH 6.7); gradual smooth boundary.
B22t	22-32"	Brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to moderate medium and fine angular and subangular blocky structure; extremely hard; firm; sticky, plastic; few roots between soil peds; common fine tubular pores; thin patchy clay films; slight organic staining on prism faces; common weathered basalt pebbles producing distinct yellowish red and reddish brown (5YR 5/6 and 5/4) mottles; neutral (pH 7.1); gradual wavy boundary.
B3	32-38"	Brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium prismatic breaking to moderate medium and fine subangular and angular blocky structure; hard; friable; sticky, plastic; few roots; many fine tubular pores; few thin patchy clay films; many angular basalt pebbles and few cobbles; mildly alkaline (pH 7.6); abrupt wavy boundary.
C1ca	38-57"	Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft; friable; nonsticky, slightly plastic; few roots; many medium and fine tubular pores; many basalt pebbles and few cobbles; strong effervescence; common krotovina; moderately alkaline (pH 8.3); clear irregular boundary.
C2	57-72"	Pale brown (10YR 6/3) angular gravelly silt loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; hard; friable; nonsticky, nonplastic; many fine tubular pores; few basalt pebbles; strong effervescence; secondary carbonates as thin veins; strongly alkaline (pH 8.8); common krotovina.

This horizon was determined by soil auger to extend to 15½ feet increasing slightly in cindery material with depth. Soil temperature on September 13, 1959, at 15½ feet, was 49.5° F. Temperature reading taken with Taylor maximum and minimum thermometer lowered to the bottom of the auger hole.

IDAHO 8-59

TOTAL ANNUAL YIELDS 1959 - 1968

Repeat Studies Based on 20 Random Estimated Plots

Precip: 12-14"
Elevation: 508(
Slope: N 19%

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp	1968 Lbs. Acre	1968 % Comp
Grasses																				
Festuca idahoensis	297	46	369	42	255	37	369	26	300	28	330	40	317	35	300	42	394	34	385	50
Agropyron spicatum	101	16	111	12	84	12	191	13	149	14	202	25	245	27	240	33	293	25	198	25
Poa secunda	92	14	164	18	73	11	570	39	309	29	107	13	142	16	48	7	78	7	46	6
Koeleria cristata	28	4	30	3	29	4	32	2	63	6	33	4	16	2	48	7	51	4	40	5
Elymus cinereus	6	1	16	2	12	2	21	1	6	T	-	-	1	T	1	T	-	-	1	T
Poa nevadensis	-	-	-	-	13	2	47	3	-	-	-	-	-	-	-	-	-	-	-	-
Forbs																				
Crepis acuminata	42	7	55	6	54	8	61	4	110	10	83	10	96	11	45	6	129	11	21	3
Phlox longifolia	9	1	15	2	15	2	11	1	15	1	3	T	6	1	3	T	24	2	4	1
Lomatium triternatum	8	1	5	T	15	2	22	2	13	1	2	T	9	1	-	-	19	2	1	T
Mertensia oblongifolia	7	1	16	2	12	2	17	1	16	2	1	T	T	T	-	-	-	-	-	-
Allium acuminatum	1	T	4	T	17	2	13	1	3	T	1	T	9	1	-	-	4	T	-	-
Astragalus filipes	5	1	14	2	8	1	-	-	16	2	T	T	-	-	-	-	5	T	1	-
Other Forbs 1/	13	2	44	5	45	7	47	3	33	3	4	1	20	2	T	T	12	1	3	T
Annuals																				
Bromus tectorum	T	T	10	1	12	2	12	1	10	1	33	4	31	3	8	1	31	3	6	1
Other Annuals 2/	3	T	6	1	9	1	5	T	11	1	-	-	3	T	-	-	40	4	2	T
Woody Plants																				
Chrysothamnus viscidiflorus	15	2	15	2	7	1	17	1	15	1	27	3	11	1	26	4	54	5	70	9
Artemisia tripartita	18	3	19	2	13	2	18	1	8	1	-	-	T	T	-	-	-	-	-	-
Artemisia tridentata	-	-	5	T	6	1	7	1	-	-	-	-	T	T	-	-	20	2	-	-
Chrysothamnus nauseosus	3	1	5	T	5	1	3	T	-	-	-	-	-	-	-	-	-	-	-	-
Purshia tridentata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	T
Total Annual Yields	648	100	903	100	684	100	1463	100	1077	100	826	100	906	100	719	100	1154	100	779	100
Total Estimated Litter 3/	2182		1932		1138		1307		1320		1138		1478		1236		1041		1002	

1/ Other forbs include Agoseris glauca, Balsamorhiza sagittata, Calochortus nitidus, Crepis occidentalis, Delphinium nelsoni, Fritillaria lanceolata, Lupinus leucophyllus, Ranunculus glaberrimus, Senecio integerrimus.
2/ Other annuals include Collinsia parviflora and Mimulus nanus.
3/ Total estimated litter, 1959 and 1960, includes humic mulch.

11/7/69 V.K.H.

BANCROFT SILT LOAM, MODERATELY DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 9-59 LABORATORY NO: S-59 Idaho 7-9

ELEVATION: 5005' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Southeastern part of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the west center of Sec. 20, T1S, R24E (BPM), approximately 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, 2 percent east-facing slope.

CLASSIFICATION: Bancroft silt loam, moderately deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: Bare surface soil,0-2 inches deep, cracksupon drying. Cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak, thin platy structure. Bare surface soil is slightly lighter in color than surface soil under vegetation.

This soil differs from Bancroft series by having bedrock at a depth less than 40 inches.

This pedon is characterized by a slightly acid mollic epipedon, a neutral, argillic horizon and a moderately alkaline calcic horizon.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-2"	(Under grass) Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak fine platy structure; soft; friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; few angular basalt pebbles; medium acid (pH 5.7); clear smooth boundary.
A12	2-7"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; common angular basalt pebbles; slightly acid (pH 6.5); clear wavy boundary.
B2t	7-18"	Brown (10YR 5/3) heavy silt loam, brown (10YR 4/3) moist; weak prismatic breaking to strong medium angular, subangular, and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; many roots mostly between soil peds; common medium and fine tubular pores; common angular basalt pebbles; patchy clay films; neutral (pH 6.8); gradual smooth boundary.
Cca	18-36"	Light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; moderate medium subangular, angular and cylindrical blocky structure; common roots; common fine tubular pores; common angular basalt pebbles; violent effervescence; common carbonate; moderately alkaline (pH 7.9); abrupt wavy boundary.
IIR	36"	Basalt bedrock.

IDAHO 9-59

TOTAL ANNUAL YIELDS 1959 - 1968

Repeat Studies Based on 20 Random Estimated Plots

Precip: 14-16"
Elevation: 5005'
Slope: E 2%

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp	1968 Lbs. Acre	1968 % Comp
Grasses																				
Festuca idahoensis	293	38	387	39	218	30	402	28	242	17	235	35	216	23	89	22	95	8	114	16
Agropyron spicatum	83	11	113	11	104	14	106	7	181	13	135	20	230	24	97	24	242	21	133	18
Poa secunda	46	6	86	9	53	7	229	16	222	16	55	8	50	5	10	2	24	2	36	5
Koeleria cristata	55	7	44	4	38	5	90	6	108	7	23	3	78	8	41	10	117	10	158	22
Agropyron riparium	10	1	17	2	7	1	16	1	28	2	2	T	-	-	-	-	26	2	4	1
Other grasses 1/	2	T	2	T	-	-	49	3	12	1	3	T	2	T	3	1	13	1	3	T
Forbs																				
Astragalus filipes	30	4	50	5	18	3	83	6	231	16	26	4	24	3	1	T	3	T	8	1
Crepis acuminata	41	5	63	6	43	6	82	6	27	2	16	2	48	5	6	1	80	7	15	2
Phlox longifolia	11	1	17	2	15	2	28	2	47	3	5	1	12	1	9	2	58	5	46	6
Lupinus leucophyllus	11	1	18	2	11	2	T	T	3	T	1	T	12	1	-	-	78	7	7	1
Lomatium triternatum	4	T	6	1	20	3	37	3	16	1	1	T	5	T	-	-	8	1	T	T
Microseris nutans	3	T	7	1	8	1	18	1	30	2	-	-	-	-	-	-	5	T	-	-
Other Forbs 2/	54	7	34	3	49	7	81	6	29	2	11	2	29	3	2	T	5	T	12	2
Annuals																				
Bromus tectorum	2	T	-	-	2	T	6	T	25	2	18	3	48	5	1	T	46	4	8	1
Other Annuals 3/	5	1	4	T	3	T	8	1	15	1	2	T	24	3	-	-	32	3	1	T
Woody Plants																				
Artemisia tripartita	135	17	142	14	126	18	173	12	188	13	130	19	153	16	120	30	235	20	161	22
Chrysothamnus viscidiflorus	5	1	6	1	10	1	24	2	24	2	10	2	28	3	33	8	97	9	19	3
Chrysothamnus nauseosus	-	-	-	-	-	-	-	-	-	-	5	1	-	-	-	-	-	-	-	-
Total Annual Yields	790	100	996	100	725	100	1432	100	1428	100	678	100	959	100	412	100	1164	100	725	100
Total Estimated Litter 4/	2385		1957		1312		1458		1042		1192		908		1133		834		890	

1/ Other grasses include Elymus cinereus, Poa nevadensis, Sitanion hystrix, Stipa thurberiana and Carex filifolia.
2/ Other forbs include Agoseris glauca, Allium acuminatum, Arnica sororia, Astragalus convallarius, Balsamorhiza sagittata, Calochortus nitidus, Eriogonum caespitosum, Eriogonum ovalifolium, Lactuca serriola, Mertensia oblongifolia, Phlox hoodii, Senecio integerrimus, and Tragopogon dubius.
3/ Other annuals include Collinsia parviflora, Collomia tenella and an unidentified mustard.
4/ Total estimated litter, 1959 and 1960, includes humic mulch.

11/7/69 V.K.H.

HONDOHO VERY STONY SILT LOAM, SHALLOW VARIANT (~~CALCIC~~ Lithic HAPLOXEROLLS)

FIELD NO: Idaho 10-59 LABORATORY NO: S-59 Idaho 7-10

ELEVATION: 5020' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Southeastern part of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, from Carey, Blaine County, Idaho. It is in the SW¼ Sec. 20, T1S, R24E (BPM), approximately 43° 20' N. and 113° 32' W. It is on a low ridge and about 50 yards east of study Idaho 9-59.

LAND FORM: Snake River Plain, gently sloping and undulating upland, occupies a 2 percent east-facing slope.

CLASSIFICATION: Hondoho very stony silt loam, shallow variant, a member of the loamy-skeletal, mixed, frigid family of ~~CALCIC~~ Lithic HAPLOXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: Bare surface soil, 0-2 inches, dries and cracks. Cracks form a prominent polygonal pattern. Polygons contain few roots, many vesicular pores and have weak thin platy structure. Local areas over shallow bedrock and containing basalt pebbles frequently form a polygonal pattern with segregated coarse particles. Stones occur throughout the soil and the bedrock contains deep crevices.

This pedon is similar to both the Hondoho and Eaglecone series. It differs from the Hondoho soils in having bedrock at a depth of less than 20 inches and from Eaglecone soils in having bedrock within 20 inches and containing more than 35 percent coarse fragments in the control section.

Pedon is characterized by a neutral, mollic epipedon, mildly alkaline cambic horizon and a calcic horizon. Bedrock, fractured and deeply creviced, occurs at a depth of 20 inches or less.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A1 0-5" (Under grass) Brown (10YR 5/3) very stony silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; contains approximately 25 percent basalt stones; neutral (pH 6.9); clear smooth boundary.

B2 5-11" Pale brown (10YR 6/3) very stony silt loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; contains approximately 25 percent basalt stones; mildly alkaline (pH 7.5); clear smooth boundary.

Cca 11-20" Light brownish gray (10YR 6/2) very stony loam, dark grayish brown (10YR 4/2) moist; moderate medium angular and subangular blocky structure; hard; friable; nonsticky, slightly plastic; common roots; common medium and fine tubular pores; strong effervescence; secondary carbonates as thin veins and disseminated; contains approximately 45 percent basalt stones; mildly alkaline (pH 7.8); abrupt irregular boundary.

IIR 20" Basalt (fractured, deeply creviced).

IDAHO 10-59

Precip: 14-16"
Elevation: 5020'
Slope: E 2%

TOTAL ANNUAL YIELDS 1959

Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp
Grasses		
Festuca idahoensis	144	18
Poa secunda	72	9
Agropyron spicatum	70	9
Koeleria cristata	26	3
Stipa thurberiana	25	3
Sitanion hystrix	5	1
Carex filifolia	20	2
Forbs		
Balsamorhiza sagittata	101	13
Astragalus filipes	13	2
Ranunculus glaberrimus	10	1
Mertensia oblongifolia	9	1
Crepis acuminata	7	1
Phlox longifolia	7	1
Other Forbs 1/	22	3
Annuals		
Bromus tectorum	1	T
Other Annuals 2/	6	1
Woody Plants		
Artemisia tridentata	133	17
Purshia tridentata	106	14
Chrysothamnus viscidiflorus	10	1
Total Annual Yields	787	100
Total Estimated Litter 3/	2130	

1/ Other forbs include Calochortus nitidus, Castilleja longispica, Erigeron canus, Eriogonum ovalifolium, Lomatium triternatum, Microseris nutan, Penstemon cusickii and Viola nuttallii var. vallicola.

2/ Other annuals include Cordylanthus ramosus, Orthocarpus luteus and Polygonum douglasii.

3/ Total estimated litter includes humic mulch.

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER CLAY VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 5-60

ELEVATION: 5270' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: North central part of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in the NE¼, Sec. 19, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain upland, 10 percent southwest-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over clay variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basaltic ash and cinders.

REMARKS: This pedon is similar to Bancroft silt loam, moderately deep over bedrock variant, Idaho 9-59, and Bancroft silt loam, deep over bedrock variant, Idaho 1-64. It differs from both of these pedons in that it is underlain by silty clay at a depth of 53 inches and has a silty clay substratum.

Surface soil, 0-3 inches, under vegetation is slightly darker in color than the bare surface soil.

Cicada nymph burrowing has influenced soil structure of horizons between the depth of 8-42 inches.

Roots of Idaho fescue and bearded bluebunch wheatgrass were observed to a depth of about 42 inches. Roots of big sagebrush extended below the bottom of the soil pit, 66 inches.

Pedon is characterized by a slightly acid, mollic epipedon, a neutral argillic horizon and a moderately alkaline calcic horizon. This soil is underlain by a silty clay, lithologic discontinuity at a depth of 52 inches.

PEDON: Pedon is described under vegetation that appears to have been altered extensively by rodents. Color is for dry soil unless otherwise stated.

A11	0-3"	(Bare surface soil between plants) Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and thin platy structure; soft; very friable; nonsticky, slightly plastic; few roots; many vesicular pores; surface cracks form a moderate polygonal pattern; slightly acid (pH 6.4 BTB); common basalt pebbles; clear smooth boundary.
A12	3-8"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure; soft; friable; nonsticky, slightly plastic; many roots; many medium and fine interstitial pores; slightly acid (pH 6.1 BTB); many basalt pebbles; many rodent krotovina; clear irregular boundary.
B21	8-19"	Brown (10YR 5/3) heavy silt loam, dark brown (10YR 3/3) moist; moderate medium and fine angular, subangular and cylindrical blocky structure; hard; firm; slightly sticky, plastic; many fine roots; many medium and fine tubular pores; neutral (pH 6.6 BTB); common basalt pebbles; diffuse smooth boundary.
B22t	19-32"	Brown (10YR 5/3) heavy silt loam, brown (10YR 4/3) moist; moderate, medium and fine angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; common roots; common medium and fine tubular pores; thin patchy clay films; neutral (pH 6.8 BTB); common basalt pebbles; abrupt wavy boundary.
C1ca	32-42"	Pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate, medium subangular, cylindrical and angular blocky structure; extremely hard; friable; slightly sticky, slightly plastic; common roots; many medium and fine tubular pores; moderately alkaline (pH 8.4 TB); strong effervescence; carbonates as fine veins and disseminated; few basalt pebbles; gradual smooth boundary.
C2ca	42-53"	Pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak subangular blocky structure; hard; friable; slightly sticky, slightly plastic; few roots; many medium and fine tubular pores; moderately alkaline (pH 8.4 TB); strong effervescence; carbonates as thin veins and disseminated; few pebbles of basalt; many basalt stones; abrupt wavy boundary.
IIC3ca	53-59"	Dark brown (10YR 4/3) silty clay, dark brown (10YR 3/3) moist; moderate medium and coarse prismatic structure; extremely hard; very firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; moderately alkaline (pH 8.4 TB); violent effervescence on prism faces but weakly effervescent near center of prisms; carbonates as veins and coating on prisms; common basalt pebbles; many concretions and flakes of manganese; clear irregular boundary.
IIC4ca	59-66"	Brown (10YR 4/3) silty clay loam, dark brown (10YR 3/3) moist; moderate fine angular blocky structure; very hard; firm; sticky, plastic; few roots; common medium and fine tubular pores; moderately alkaline (pH 8.4 TB); strong effervescence; carbonates as veins and coatings on peds; many concretions and flakes of manganese; many weathered basalt pebbles; abrupt irregular boundary.
IIIR	66"	Basalt bedrock.

IDAHO 5-60

Precip: 14-16"
Elevation: 5270'
Slope: SW 10%

TOTAL ANNUAL YIELDS 1960-1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses				
Elymus cinereus	57	6	45	4
Agropyron spicatum	49	5	46	4
Festuca idahoensis	26	3	32	3
Poa secunda	17	2	26	2
Sitanion hystrix	-	-	4	T
Forbs				
Balsamorhiza sagittata	42	4	38	4
Crepis acuminata	37	4	42	4
Phlox longifolia	21	2	16	2
Lupinus leucophyllus	17	2	16	2
Lomatium triternatum	11	1	17	2
Allium acuminatum	9	1	15	1
Other Forbs 1/	11	1	8	1
Annuals				
Bromus tectorum	187	20	261	26
Other annuals 2/	75	8	59	6
Woody Plants				
Artemisia tridentata	269	28	251	25
Artemisia tripartita	72	8	94	9
Chrysothamnus viscidiflorus	42	4	19	2
Chrysothamnus nauseosus	12	1	31	3
Total Annual Yields	954	100	1020	100
Total Estimated Litter	1634		1430	

1/ Other forbs include Agoseris glauca, Delphinium nelsoni, Senecio integerrimus and Tragopogon dubius.

2/ Other annuals include Chenopodium album, Collinsia parviflora, Collomia tenella Cordylanthus ramosus, Cryptantha watsonii, Descurainia sophia, Gayophytum racemosum, Lappula redowshii and Mentzelia spp.

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 1-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: North end of Laidlaw Park near the "thumb", 25 miles, via road, from Carey, Blaine County, Idaho. It is in the NW¼, Sec. 21, T1S, R24E (BPM); 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping undulating upland, one percent southwest-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: Bare surface soil, 0-2 inches, cracks upon drying and the cracks form a prominent polygonal pattern. Polygons have weak thin platy structure, contain few roots and many vesicular pores. Bare surface soil is slightly lighter in color than surface soil under vegetation.

Cicada nymph burrowing between the 10 and 23 inch depth has influenced soil structure.

Soil is similar to Bancroft silt loam, moderately deep over bedrock variant, Idaho 9-59, except the argillic horizon contains a higher percentage of clay and it is deeper to bedrock.

Idaho fescue roots were observed to a depth of 38 inches and roots from threetip sagebrush to a depth of 41 incnes, bedrock.

Soil is characterized by a neutral, mollic epipedon, a neutral, argillic horizon and a moderately alkaline calcic horizon.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-6"	(Under vegetation) Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and fine platy structure; very soft; friable; slightly sticky, slightly plastic; many fine roots; many medium and fine interstitial pores; neutral (pH 6.6 BTB); few fine basalt pebbles; clear smooth boundary.
A12	6-10"	Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard; friable; slightly sticky, slightly plastic; many fine roots; many medium and fine tubular pores; neutral (pH 6.6 BTB); few basalt pebbles; clear smooth boundary.
B21	10-15"	Brown (10YR 5/3) heavy silt loam, dark brown (10YR 3/3) moist; moderate medium angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; common fine roots; common medium and fine tubular pores; common weathered basalt pebbles; neutral (pH 6.6 BTB); gradual smooth boundary.
B22t	15-23"	Pale brown (10YR 6/3) light silty clay loam, brown (10YR 4/3) moist; weak prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; very hard; firm; slightly sticky, plastic; common fine roots between soil peds; neutral (pH 7.2 BTB); thin patchy clay films; common weathered basalt pebbles; few fine tubular pores; clear smooth boundary.
B23	23-28"	Brown (10YR 5/3) heavy silty clay loam, brown (10YR 4/3) moist; weak prismatic breaking to moderate medium and fine angular blocky structure; very hard; firm; sticky, plastic; few roots mostly between soil peds; thin patchy clay films; mildly alkaline (pH 7.4 BTB); common weathered basalt pebbles; clear wavy boundary.
B23ca	28-35"	Brown (10YR 5/3) heavy silty clay loam, brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium angular blocky structure; very hard; firm; sticky, plastic; few fine roots between soil peds; strong effervescence; secondary carbonates disseminated and as veins on prisms; moderately alkaline (pH 8.4 TB); common weathered basalt pebbles; thin patchy clay films; clear irregular boundary.
C1ca	35-41"	Very pale brown (10YR 8/3) silty clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; sticky, plastic; few roots; common very fine tubular pores; violent effervescence; secondary carbonates as thick veins and pockets; moderately alkaline (pH 8.4 TB); abrupt irregular boundary.
IIR	41"	Fractured basalt.

IDAHO 1-64

Precip: 14-16"
Elevation: 5000'
Slope: SW 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Agropyron spicatum	212	25
Festuca idahoensis	165	19
Poa secunda	111	13
Koeleria cristata	78	9
Agropyron riparium	3	T
Carex filifolia	36	4
Forbs		
Astragalus convallarius	28	3
Crepis acuminata	25	3
Phlox hoodii	12	2
Astragalus filipes	10	1
Phlox longifolia	4	T
Lomatium triternatum	3	T
Calochortus nitidus	1	T
Other Forbs 1/	T	T
Annuals		
Bromus tectorum	T	T
Cordylanthus ramosus	2	T
Woody Plants		
Artemisia tripartita	124	15
Chrysothamnus viscidiflorus	30	4
Tetradymia canscens	12	2
Total Annual Yields	856	100
Total Estimated Litter	1106	

1/ Other forbs include Agoseris glauca, Allium acuminatum and Lomatium triternatum.

11/10/69 V.K.H.

BANCROFT SILT LOAM, NONCALCAREOUS VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 2-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Northern end of Laidlaw Park near the "thumb", 25 miles, via road, east of Carey, Blaine County, Idaho. It is in the NW¼, Sec. 28, T1S, R24E (BPM), 43° 21' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent northwest-facing slope.

CLASSIFICATION: Bancroft silt loam, noncalcareous variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: This pedon is similar to the Bancroft series except it is noncalcareous, has a pH below 7.0 to a depth of 53 inches and lacks a calcic horizon. On the basis of soil laboratory data in the vicinity it is assumed that saturation with sodium and potassium increases with an increase in depth to 43 inches. It is, therefore, classified as a Calcic Argixeroll. Pedon is characterized by a slightly acid, mollic epipedon, a neutral, argillic horizon and a neutral C horizon.

Cicada nymphs have influenced soil structure between 13 and 46 inch depth.

Basalt pebbles are scattered throughout the profile but their number increased sharply below a depth of 46 inches. Basalt stones occurred below a depth of 36 inches.

This study is located in a position to receive run-on from surrounding areas.

PEDON: Pedon is described under near potential vegetation. Area is currently being grazed by cattle. Color is for dry soil unless otherwse stated.

A1	0-6"	(Under vegetation) Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial and common fine tubular pores; slightly acid (pH 6.4 BTB); clear smooth boundary.
A12	6-13"	Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; slightly acid (pH 6.4 BTB); gradual smooth boundary.
B21t	13-19"	Dark brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic breaking into moderate medium subangular, angular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; thin patchy clay films in pores; common fine roots; many fine and common medium tubular pores; slightly acid (pH 6.2 BTB); gradual smooth boundary.
B22t	19-28"	Brown (10YR 5/3) heavy silt loam, dark brown (10YR 4/3) moist; weak medium and coarse prismatic breaking into moderate medium angular, subangular and cylindrical blocky structure; extremely hard; friable; slightly sticky, plastic; thin patchy clay films in pores and as bridges between soil particles; common fine roots mostly between soil peds; many fine tubular pores; neutral (pH 6.6 BTB); bleached sand and silt grains on vertical ped faces; gradual smooth boundary.
B3	28-36"	Brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; weak medium subangular, angular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; few roots; many medium and fine tubular pores; bleached sand and silt grains on ped vertical faces; neutral (pH 6.6 BTB); gradual smooth boundary.
C1	36-46"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium subangular, angular and cylindrical blocky structure; hard; friable; slightly sticky, plastic; few roots; many fine tubular pores; common basalt stones and pebbles; neutral (pH 6.8 BTB); clear smooth boundary.
IIC2	46-53"	Brown (10YR 5/3) silty clay loam, dark brown (10YR 3/3) moist; massive; hard; firm; sticky, plastic; few roots; many fine tubular pores; many fine pebbles and basalt stones; neutral (pH 6.8 BTB).

IDAHO 2-64

Precip: 14-16"
Elevation: 5000'
Slope: NW 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Festuca idahoensis	295	21
Koeleria cristata	101	7
Agropyron spicatum	59	4
Poa secunda	25	2
Stipa columbiana	23	2
Agropyron riparium	5	T
Carex filifolia	105	7
Forbs		
Lupinus spp.	227	16
Phlox longifolia	18	1
Phlox hoodii	5	T
Astragalus convallarius	4	T
Annuals		
Cordylanthus ramosus	17	1
Woody Plants		
Artemisia tripartita	539	38
Chrysothamnus viscidiflorus	12	1
Tetradymia canscens	1	T
Total Annual Yields	1436	100
Total Estimated Litter	1231	

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 4-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Northern end of Laidlaw Park near the "thumb", 25 miles, via road, east of Carey, Blain County, Idaho. It is in the NE¼, Sec. 32, T1S, R24E (BPM), 43° 20'N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent north-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: This soil is similar to the Bancroft series, except it is underlain by bedrock at a depth of 48 inches. This pedon is characterized by a slightly acid, mollic epipedon, a neutral, argillic horizon and a calcic horizon. Bedrock occurs at a depth of 48 inches.

Cicada nymph burrowing has influenced soil structure between 7 and 35 inches deep.

Roots of Idaho fescue and bearded bluebunch wheatgrass were observed to a depth of 35 inches. Threetip sagebrush roots penetrated to bedrock, 48 inches.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-3"	(Bare area between vegetation) Dark grayish brown (10YR 4/2) light silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine platy structure; soft; friable; nonsticky, nonplastic; few roots; surface cracks and forms a prominent polygonal pattern; many vesicular pores; slightly acid (pH 6.4 BTB); common scattered basalt pebbles; clear smooth boundary.
A12	3-7"	Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft; friable; nonsticky, slightly plastic; many medium and fine tubular pores; many medium and fine roots; slightly acid (pH 6.4 BTB); common basalt pebbles; clear smooth boundary.
B1	7-17"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; many roots; many fine tubular pores; neutral (pH 6.6 BTB); common basalt pebbles; gradual smooth boundary.
B2t	17-28"	Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium and coarse prismatic breaking into moderate angular, subangular and cylindrical blocky structure; thin patchy clay films; common roots mostly between soil peds; many fine tubular pores; neutral (pH 6.8 BTB); common basalt pebbles; clear wavy boundary.
B3ca	28-35"	Pale brown (10YR 6/3) light silty clay loam, brown (10YR 4/3) moist; moderate medium subangular, angular and cylindrical blocky structure; hard; friable; slightly sticky, plastic; few roots; many fine tubular pores; strong effervescence; secondary carbonates disseminated and as veins and soft pockets; moderately alkaline (pH 8.2 TB); many basalt pebbles; clear wavy boundary.
IIC1ca	35-41"	Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure; very hard; friable; sticky, plastic; common fine tubular pores; few roots; strong effervescence; secondary carbonates as thick veins; moderately alkaline (pH 8.4 TB); many basalt pebbles; clear wavy boundary.
IIC2ca	41-48"	Very pale brown (10YR 8/3) stony silt clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; sticky, plastic; many fine tubular pores; few roots; violent effervescence; secondary carbonates disseminated; moderately alkaline (pH 8.4 TB); 40 percent basalt stones; abrupt irregular boundary.
IIIR	48" +	Basalt.

IDAHO 4-64

Precip: 14-16"
Elevation: 5000'
Slope: N 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Festuca idahoensis	150	17
Agropyron spicatum	145	16
Poa secunda & nevadensis	68	8
Koeleria cristata	29	3
Agropyron riparium	28	3
Elymus cinereus	16	2
Stipa columbiana	16	2
Carex filifolia	25	3
Forbs		
Lupinus spp.	48	5
Phlox hoodii	26	3
Astragalus cibarius	6	1
Astragalus convallarius	6	1
Phlox longifolia	4	T
Other Forbs 1/	4	T
Annuals		
Cordylanthus ramosus	27	3
Woody Plants		
Chrysothamnus viscidiflorus	154	17
Artemisia tripartita	104	12
Tetradymia canscens	35	4
Total Annual Yields	891	100
Total Estimated Litter	670	

1/ Other forbs include Agoseris glauca, Calochortus nitidus, Erigeron pumilus and Lomatium triternatum.

11/10/69 V.K.H.

BANCROFT SILT LOAM, DEEP OVER BEDROCK VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 5-64

ELEVATION: 5000' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Northern end of Laidlaw Park, 25 miles, via road, from Carey, Blaine County, Idaho. It is in the NE¼, Sec. 32, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, one percent north-facing slope.

CLASSIFICATION: Bancroft silt loam, deep over bedrock variant, a member of the fine-silty, mixed, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and some basalt.

REMARKS: This pedon is similar to the Bancroft series except it is underlain by bedrock at a depth of 52 inches. It is characterized by a neutral, mollic epipedon, a neutral, argillic horizon and a moderately alkaline calcic horizon.

Cicada nymph burrowing between the 10 and 36 inch depth has modified the soil structure.

Roots of Lupine and threetip sagebrush were observed to bedrock, 52 inches. Idaho fescue roots were observed to a depth of 36 inches.

PEDON: Pedon is described under vegetation likely altered by grazing. Color is for dry soil unless otherwise stated.

A11 0-3" (Bare area between vegetation) Dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, nonplastic; many vesicular pores; few roots; surface cracks form a prominent polygonal pattern; neutral (pH 6.6 BTB); common pebbles; clear smooth boundary.

A12 3-10" Brown (10YR 4/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular structure; soft; friable; nonsticky, slightly plastic; many medium and fine tubular pores; many roots; neutral (pH 6.6 BTB); common basalt pebbles; clear smooth boundary.

B21 10-16" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, slightly plastic; many fine and medium tubular pores; many roots; neutral (pH 6.6 BTB); gradual smooth boundary.

B22t 16-28" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic breaking into moderate medium angular, subangular and cylindrical blocky structure; extremely hard; friable; slightly sticky, slightly plastic; common fine tubular pores; common roots; neutral (pH 6.6 BTB); thin patchy clay films; clear wavy boundary.

B3ca 28-36" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; extremely hard; friable; slightly sticky, plastic; strong effervescence; secondary carbonates as veins, coatings on peds and soft pockets; mildly alkaline (pH 7.8 PR); common roots; common medium and fine tubular pores; clear wavy boundary.

IIC1ca 36-46" Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak coarse prismatic breaking to moderate fine angular blocky structure; very hard; firm; sticky, plastic; few roots; few fine tubular pores; strong to violent effervescence; secondary carbonates as veins and coatings on peds; moderately alkaline (pH 8.2 TB); clear irregular boundary.

IIC2ca 48-52" Very pale brown (10YR 8/3) silty clay loam, pale brown (10YR 6/3) moist; massive; hard; friable; sticky, plastic; few roots; many medium and fine tubular pores; violent effervescence; secondary carbonates disseminated and as veins and soft pockets; moderately alkaline (pH 8.3 TB); abrupt irregular boundary.

IIIR 52" + Basalt.

IDAHO 5-64

Precip: 14-16"
Elevation: 5000'
Slope: N 1%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Agropyron riparium	268	43
Poa secunda & nevadensis	102	16
Agropyron spicatum	77	12
Festuca idahoensis	53	8
Koeleria cristata	4	1
Carex filifolia	18	3
Forbs		
Phlox hoodii	39	6
Phlox longifolia	10	1
Astragalus convallarius	5	1
Erigeron pumilus	2	T
Annuals		
Bromus tectorum	T	T
Other annuals	3	T
Woody Plants		
Artemisia tripartita	40	7
Chrysothamnus viscidiflorus	12	2
Total Annual Yields	633	100
Total Estimated Litter	910	

1/ Other annuals include Chenopodium album, Cordylanthus ramosus and Cryptantha watsonii.

11/26/69 V.K.H.

PORTNEUF SILT LOAM NONCALCAREOUS SUBSOIL VARIANT
(XEROLLIC CAMBORTHID)

FIELD NO: Idaho 13-59

ELEVATION: 4320' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 50° F.

LOCATION: Minidoka County, Idaho, 5 miles north and 4½ miles west of Paul, SW¼, Sec. 34, T8S, R22E (BPM); 1000 feet east and 700 feet north of the southwest corner Sec. 34, 42° 35' N, 113° 46' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, 2½ percent northeast slope.

CLASSIFICATION: Portneuf silt loam, noncalcareous subsoil variant, a member of the coarse-silty, mixed, mesic family of XEROLLIC CAMBORTHIDS.

PARENT MATERIAL: Eolian, loess.

REMARKS: This pedon is similar to the Portneuf series except it is leached of carbonates to a depth of 20 inches. Therefore, it has been called a noncalcareous subsoil variant of Portneuf. It is characterized by a slightly acid, ochric epipedon, neutral cambic horizon and a strongly alkaline, calcic horizon. Pebbles of basalt are scattered throughout the profile. Surface soil under vegetation is slightly darker in color than the bare surface soil.

Roots of big sagebrush continued below the bottom of the soil pit, 53 inches. Bearded bluebunch wheatgrass roots extended to a depth of about 40 inches.

Cicada nymphs are evident and the soil structure of the B2 and C1ca horizons is directly influenced by their burrowing activity.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11 0-2" (Between plants) Light brownish gray (10YR 6/2) light silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft; very friable; non-sticky; nonplastic; few fine roots; many medium and fine vesicular pores; (pH 6.4 BTB); cracks upon drying and forms a prominent polygonal pattern; clear smooth boundary.

B1 2-9" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak coarse prismatic breaking to weak, medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many medium and fine roots; common medium and fine tubular pores; (pH 6.4 BTB); gradual smooth boundary.

B2 9-20" Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak coarse prismatic breaking to moderate medium, angular, subangular and cylindrical blocky structure; very hard; slightly firm; slightly sticky, slightly plastic; common medium and fine roots; common medium fine and few coarse tubular pores; (pH 6.8 BTB); clear wavy boundary.

C1ca 20-40" Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate medium angular, subangular and cylindrical blocky structure; very hard; firm; slightly sticky, slightly plastic; few medium and fine roots; few medium and fine tubular pores; strongly calcareous; secondary carbonates disseminated and as thin veins and nodules; (pH 8.8 TB); diffused wavy boundary.

C2ca 40-63" Very pale brown (10YR 7/3) light silt loam, brown (10YR 5/3) moist; massive; soft; very friable; nonsticky, nonplastic; few fine roots; few medium and fine tubular pores; strongly calcareous; secondary carbonates as veins; (pH 9.4 TB).

Note: Soil profile was examined to a depth of 113 inches with a soil auger.

C3ca 63-110" Similar to the horizon described above except it was slightly more compact and contained more veins of secondary carbonates.

C4cam 110-113" Very pale brown (10YR 7/3) light silt loam, moderately cemented with carbonate.

IIR 113" + Bedrock.

IDAHO 13-59

Precip: 7-9"
Elevation: 4320'
Slope: NE 2%

TOTAL ANNUAL YIELDS 1959

Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp
Grasses		
Stipa thurberiana	254	40
Agropyron spicatum	176	28
Sitanion hystrix	62	10
Poa secunda	22	4
Agropyron saxicola	6	1
Forbs		
Phlox longifolia	7	1
Allium acuminatum	1	T
Antennaria dimorpha	1	T
Annuals		
Bromus tectorum	1	T
Other Annuals 1/	3	T
Woody Plants		
Artemisia tridentata	101	16
Artemisia tripartita	2	T
Total Annual Yields	636	100
Total Estimated Litter 2/	1089	

1/ Other annuals include Festuca pacifica, Hackelia patens, Phlox gracilis and a tiny crucifer.

2/ Total estimated litter includes humic mulch.

11/26/69 V.K.H.

PORTNEUF SILT LOAM, NONCALCAREOUS SUBSOIL VARIANT
(XEROLLIC CAMBORTHID)

FIELD NO: Idaho 14-59

ELEVATION: 4250' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 50° F.

LOCATION: Minidoka County, Idaho, 5 miles north and 3¼ miles west of Paul, NW¼ of the NW¼, Sec. 2, T9S, R22E (BPM), 900 feet east and 150 feet south of NW corner Sec. 2; 42° 35' N, 113° 46' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, 1 percent east-facing slope.

CLASSIFICATION: Portneuf silt loam, noncalcareous subsoil variant, a member of the coarse-silty, mixed, mesic family of XEROLLIC CAMBORTHIDS.

PARENT MATERIAL: Eolian, loess.

REMARKS: This pedon is similar to the Portneuf series except it is leached of carbonates to a depth of 14 inches. Therefore, it was called a noncalcareous subsoil variant of Portneuf. It is characterized by a slightly acid, ochric epipedon, neutral, cambic horizon and a strongly alkaline, calcic horizon. Basalt bedrock occurs at a depth of 70 inches. Pebbles of basalt are scattered throughout the profile.

Roots of big sagebrush continued beyond the bottom of the soil pit, 70 inches, into bedrock crevices. Roots of Thurbers needlegrass were observed to a depth of about 30 inches and bearded bluebunch wheatgrass roots to 40 inches. Roots of Sandberg bluegrass extended to around 15 inches.

Cicada nymph burrowing is very evident in the B2 and C1ca horizons and largely responsible for soil structure.

Surface soils under vegetation slightly darker in color than bare surface soils.

PEDON: Pedon is described under potential vegetation. Color for dry soil unless otherwise stated.

A11 0-2½" (Under bare surface soil) Light brownish gray (10YR 6/2) light silt loam, dark grayish brown (10YR 4/2) moist; weak medium and thin platy structure; soft; very friable; nonsticky, nonplastic; few fine roots; many vesicular pores; cracks upon drying and forms a prominent polygonal pattern; slightly acid (pH 6.4 BTB); clear smooth boundary.

A12 2½-5" Light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; few medium and coarse tubular pores; slightly acid (pH 6.4 BTB); clear wavy boundary.

B2 5-14" Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak coarse prismatic breaking to moderate, medium, angular, subangular and cylindrical blocky structure; hard; friable; nonsticky, slightly plastic; many medium and fine roots; common medium and fine and few coarse tubular pores; neutral (pH 6.6 BTB); clear wavy boundary.

C1ca 14-32" Very pale brown (10YR 8/3) silt loam, pale brown (10YR 6/3) moist; strong medium and fine angular, subangular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; common medium and fine roots; few medium and fine tubular pores; strong effervescence; strongly alkaline (pH 8.8 TB); secondary carbonates disseminated and as veins and nodules; gradual wavy boundary.

C2 32-70" Very pale brown (10YR 7/3) light silt loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, nonplastic; few fine roots; common medium and fine tubular pores; strong effervescence; very strongly alkaline (pH 9.6 TB); abrupt irregular boundary.

IIR 70" Basalt stones or bedrock.

IDAHO 14-59

Precip: 7-9"
Elevation: 4250'
Slope: E 1%

TOTAL ANNUAL YIELDS 1959

Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp
Grasses		
Agropyron spicatum	433	63
Sitanion hystrix	52	7
Poa secunda	12	2
Stipa thurberiana	1	T
Forbs		
Phlox longifolia	7	1
Erigeron pumilus	3	T
Lomatium circumdatum	1	T
Annuals		
Bromus tectorum	T	T
Other Annuals 1/	2	T
Woody Plants		
Artemisia tridentata	184	27
Chrysothamnus viscidiflorus	3	T
Total Annual Yields	698	100
Total Estimated Litter 2/	1435	

1/ Other annuals include Descurainia pinnata, Festuca pacifica and Salsola kali.

2/ Total estimated litter includes humic mulch.

11/26/69 V.K.H.

WAYCUP EXTREMELY STONY SILT LOAM, NONCALCAREOUS SUBSOIL VARIANT
(XEROLLIC ~~CAMBORTHID~~ CALCIORTHID)

FIELD NO: Idaho 3-58

ELEVATION: 4695' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, approximately 21 miles northwest of American Falls on the south side of the Little Crater Kipuka, SW¼, Sec. 24, T6S, R28E, (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Sloping and rolling uplands, Snake River Plain, 15 percent south-facing slope.

CLASSIFICATION: Waycup extremely stony silt loam, noncalcareous subsoil variant, a member of the loamy-skeletal, mixed, mesic family of XEROLLIC ~~CAMBORTHIDS~~ CALCIORTHIDS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is similar to the Waycup series except it is noncalcareous to a depth of 15 inches. Therefore, it has been called a noncalcareous subsoil variant of the Waycup Series. This pedon differs from the Portino series in containing more than 35 percent coarse fragments in its control section and being noncalcareous to a depth of 15 inches. It is characterized by a neutral, ochric epipedon, mildly alkaline, cambic horizon, and a mildly to moderately alkaline calcic horizon. Stones of basalt are concentrated on the soil surface and below a depth of 15 inches.

Roots of Thurber needlegrass extended to a depth of about 28 inches and bearded bluebunch wheatgrass to a depth of 41 inches. Big sagebrush roots extended into the porous basalt below a depth of 41 inches.

Cicada nymph burrowing is very evident in the Clca horizon and have directly influenced the soil structure of this horizon.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-3"	(Bare surface) Light brownish gray (10YR 6/2) extremely stony silt loam, dark grayish brown (10YR 4/2) moist; weak medium and thin platy structure; soft; friable; nonsticky, slightly plastic; few fine roots; many vesicular pores; neutral (pH 7.1); 40 percent of the soil volume is occupied by stones; surface cracks and forms a prominent polygonal pattern; clear smooth boundary.
A12	3-8"	Brown (10YR 5/3) stony silt loam, dark brown (10YR 3/3) moist; weak subangular blocky structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine and few coarse tubular pores; neutral (pH 7.2); 10-15 percent stones; clear smooth boundary.
B2	8-15"	Pale brown (10YR 6/3) stony silt loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; common medium and fine roots; many medium and fine tubular pores; mildly alkaline (pH 7.4); 5 percent basalt pebbles and occasional stone; abrupt wavy boundary.
Clca	15-23"	Very pale brown (10YR 7/3) extremely stony fine sandy loam; brown (10YR 5/3) moist; moderate medium and fine subangular, angular and cylindrical blocky structure; hard; friable; nonsticky, nonplastic; common medium and fine roots; common medium and fine tubular pores; strong effervescence; secondary carbonates disseminated and as coatings on stones; mildly alkaline (pH 7.6); 40 percent stones and pebbles; abrupt boundary.
C2ca	23-41"	Very pale brown (10YR 7/3) extremely stony fine sandy loam, brown (10YR 5/3) moist; massive; loose; very friable; nonsticky, nonplastic; strong effervescence; secondary carbonates disseminated and coatings on stones; mildly alkaline (pH 8.0); 70 percent fractured and platy porous basalt; abrupt wavy boundary.
IIR	41"	Bedrock, porous basalt containing "tubes".

IDAHO 3-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20 Random Estimated Plots[1/]

Precip: 8-10"
Elevation: 4695'
Slope: S 15%

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp
Grasses																				
Agropyron spicatum	264	27	150	21	251	31	178	29	209	22	338	30	249	25	251	26	197	48	256	31
Stipa thurberiana	400	40	135	19	99	12	89	15	92	10	53	4	58	6	118	12	73	18	197	24
Poa secunda	61	6	30	4	75	9	55	9	94	10	97	9	99	10	50	5	19	5	26	3
Sitanion hystrix	8	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poa nevadensis	-	-	-	-	-	-	1	T	1	T	-	-	-	-	-	-	-	-	-	-
Forbs																				
Balsamorhiza sagittata	46	4	106	15	114	14	47	8	82	9	98	9	140	14	195	20	29	7	37	5
Phlox longifolia	15	2	27	4	36	4	20	2	25	3	33	3	68	7	15	1	11	3	35	4
Crepis acuminata	23	2	29	4	44	5	22	4	37	4	4	T	43	4	41	4	6	1	19	2
Lomatium macdougali	-	-	-	-	11	1	14	2	34	4	9	1	26	3	2	T	-	-	4	T
Phlox hoodii	-	-	3	T	12	1	6	1	3	T	8	1	16	1	7	1	6	1	15	2
Calochortus nitidus	T	T	-	-	8	1	4	1	13	1	16	1	2	T	6	1	-	-	8	1
Other Forbs [2/]	13	1	1	T	16	2	29	5	25	3	12	1	18	2	1	T	2	T	20	3
Annuals																				
Bromus tectorum	9	1	63	9	29	4	33	5	167	18	279	25	177	18	178	18	T	T	104	13
Other Annuals [3/]	-	-	2	T	4	T	2	T	1	T	4	T	1	T	T	T	T	T	3	T
Woody Plants																				
Artemisia tridentata	164	16	174	24	129	16	117	19	150	16	183	16	101	10	122	12	70	17	89	11
Opuntia polyacantha	4	T	-	-	-	-	1	T	-	-	-	-	1	T	1	T	-	-	7	1
Leptodactylon pungens	-	-	-	-	-	-	T	T	-	-	-	-	-	-	-	-	T	T	-	-
Total Annual Yields	1007	100	720	100	828	100	618	100	933	100	1134	100	999	100	987	100	413	100	820	100
Total Estimated Litter [4/]	1245		1595		1375		854		806		835		735		1251		890		595	

1/ 10 plots estimated in 1958.

2/ Other forbs include Agoseris glauca, Allium acuminatum, Antennaria dimorpha, Astragalus purshii, Castilleja longispica, Delphinium nelsoni, Erigeron pumilus, Eriogonum ovalifolium, Lomatium triternatum and Penstemon spp.

3/ Other annuals include Collinsia parviflora, Collomia tenella and Cryptantha flavoculata.

4/ Total estimated litter, 1958, 1959 and 1960 includes humic mulch.

11/26/69 V.K.H.

NEELEY LOAM, FINE LOAMY SUBSOIL VARIANT (CALCIORTHIDIC HAPLOXEROLL)

FIELD NO: Idaho 4-58 LABORATORY NO: S-58 Idaho 39-4

ELEVATION: 4700' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, 21 miles northwest of American Falls on the west side of the Little Crater Kipuka, SW¼, Sec. 23, T6N, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Sloping and rolling upland, Snake River Plain, 12 percent west-facing slope.

CLASSIFICATION: Neeley loam, fine loamy subsoil variant, a member of the fine-loamy, mixed, mesic family of CALCIORTHIDIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is similar to the Neeley series except it contains more than 18 percent clay in the control section and more than 15 percent fine or coarser sands. Therefore, it is out of the range of the Neeley series and is called a fine-loamy subsoil variant of the series.

Vegetation and litter cover about 35 percent of the ground, stones 5 percent and 60 percent is bare. Bare surface soils are slightly lighter in color than surface soils under vegetation and crack upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have a weak thin platy structure and contain many vesicular pores and a few fine roots.

This pedon is characterized by a neutral to mildly alkaline, mollic epipedon, moderately alkaline cambic horizon and a strongly alkaline calcic horizon. It is underlain by a buried soil at a depth of 34 inches, which contains a natric horizon.

Cicada nymph burrowing is evident and structure of the B2 and Clca horizons has been modified by their activity.

Roots of bearded bluebunch wheatgrass extended to a depth of 34 inches; Thurber needlegrass to 26 inches; Sandberg bluegrass to 12 inches; and big sagebrush to more than 73 inches.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A1	0-4"	(Under grass) Grayish brown (10YR 5/2) loam, dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, nonplastic; many medium and fine roots; many fine interstitial pores; neutral (pH 7.3); clear smooth boundary.
B1	4-12"	Brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; medium subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many medium and fine roots; common medium and fine tubular pores; mildly alkaline (pH 7.7); common pebbles of basalt; clear wavy boundary.
B2	12-21"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate medium and fine angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; common medium and fine roots; common medium and fine tubular pores; strong effervescence; moderately alkaline (pH 8.1); common pebbles of basalt; gradual wavy boundary.
Clca	21-34"	Light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; moderate medium angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; few fine roots; common medium and fine tubular pores; strong effervescence; very strongly alkaline (pH 9.1); numerous fine basalt pebbles; common rodent krotovina (horizon destroyed in places); clear wavy boundary.
IIA1b	34-38"	Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; weak fine platy structure; soft; friable; nonsticky, slightly plastic; few medium and fine roots; common medium and fine tubular pores; strongly effervescent; strongly alkaline (pH 8.7); many basalt pebbles; clear wavy boundary.
IIB2tb	38-46"	Pale brown (10YR 6/3) silty clay loam; brown (10YR 5/3) moist; weak medium prismatic breaking to moderate fine; and very fine subangular blocky structure; hard; friable; sticky, plastic; few fine roots; many fine tubular pores; strong effervescence; strongly alkaline (pH 9.0); secondary coarbonates as veins and disseminated; gradual smooth boundary.
IIC1cab	46-62"	Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; loose; very friable; nonsticky, nonplastic; few fine roots; many fine pebbles of basalt; strong effervescence; strongly alkaline (pH 9.0); abrupt wavy boundary.
IIC2b	62-73"	Very pale brown (10YR 7/2) gravelly silt loam, brown (10YR 5/4) moist; massive; loose; nonsticky, nonplastic; few fine roots; strong effervescence; very strongly alkaline (pH 9.2); 65 percent stones and pebbles of basalt (cinders). This horizon occurs as pockets between basalt stones.
IIIRb	73"	Porous basalt bedrock.

IDAHO 4-58

Precip: 8-10"
Elevation: 4700'
Slope: W 12%

TOTAL ANNUAL YIELDS 1958 & 1961

Repeat Studies Based on 20 Random Estimated Plots 1/

Species	1958 Lbs. Acre	1958 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses				
Agropyron spicatum	320	40	242	34
Stipa thurberiana	52	6	33	5
Poa secunda	38	5	33	5
Poa nevadensis	3	T	7	1
Sitanion hystrix	-	-	2	T
Forbs				
Balsamorhiza sagittata	76	10	76	10
Penstemon spp.	74	9	31	4
Crepis acuminata	42	5	56	8
Phlox hoodii	61	8	23	3
Phlox longifolia	16	2	15	1
Lomatium triternatum	3	T	22	3
Other Forbs 2/	8	1	51	7
Annuals				
Bromus tectorum	T	T	1	T
Other Annuals 3/	7	1	T	T
Woody Plants				
Artemisia tridentata	101	13	121	17
Chrysothamnus viscidiflorus	4	T	16	2
Opuntia polyacantha	-	-	2	T
Total Annual Yields	805	100	731	100
Total Estimated Litter 4/	1677		927	

1/ 10 plots estimated in 1958.

2/ Other forbs include Allium acuminatum, Antennaria dimorpha, Astragalus convallarius, Astragalus purshii, Calochortus nitidus, Castilleja longispica, Delphinium nelsoni, Erigeron pumilus, Eriogonum ovalifolium, Fritillaria lanceolata, and Lomatium macdougali.

3/ Other annuals include Collinsia parviflora, Collomia tenella and Cordylanthus ramosus.

4/ Total estimated litter for 1958 includes humic mulch.

11/26/69 V.K.H.

KUCERA SILT LOAM, DEEP OVER BEDROCK VARIANT
CALCIC PACHIC HAPLOXEROLL)

FIELD NO: Idaho 5-58

ELEVATION: 4700' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, east side of the Little Crater Kipuka, 21 miles northwest of American Falls, SW¼, Sec. 24, T6S, R28E (BPM); 42° 52' N, 113° 08' W.

LAND FORM: Sloping and rolling upland, Snake River Plain, 18 percent east-facing slope.

CLASSIFICATION: Kucera silt loam, deep over bedrock variant, a member of the coarse loamy, mixed, frigid family of CALCIC PACHIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is characterized by a deep, neutral, mollic epipedon, a neutral, cambic horizon, and a moderately alkaline, calcic horizon. Bedrock occurs at a depth of 54 inches. This soil is similar to the Kucera series except it is underlain by bedrock, basalt, at 54 inches and, therefore, is a variant of this series.

Approximately 58 percent of the ground surface is bare and 42 percent is covered by vegetation and/or litter. Bare surface soils are slightly lighter in color than surface soil under vegetation and crack upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

Roots of bearded bluebunch wheatgrass extended to a depth of about 40 inches, Thurber needlegrass to 30 inches, and big sagebrush to bedrock where they entered crevices.

Cicada nymph burrowing is extensive in this soil and has influenced the soil structure of the A3, B2, Clca and Clc^a horizons.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial pores; neutral (pH 6.8); common fine basalt pebbles; clear smooth boundary.
A12	4-8"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine tubular pores; neutral (pH 6.8); common basalt pebbles; clear smooth boundary.
A3	8-23"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium prismatic breaking to moderate medium subangular, angular and cylindrical blocky structure; hard; friable; nonsticky, slightly plastic; common medium and fine roots; many fine and medium tubular pores; neutral (pH 6.9); common basalt pebbles; gradual smooth boundary.
B2	23-36"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium and fine subangular, angular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; common medium and fine roots; common medium and fine tubular pores; neutral (pH 7.1); common basalt pebbles; abrupt wavy boundary.
Clca	36-51"	Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate medium and fine angular, subangular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; common medium and fine roots; common medium and fine tubular pores; strong effervescence; moderately alkaline (pH 7.9); common basalt pebbles; clear wavy boundary.
C2ca	51-54"	Light gray (10YR 7/2) very fine sandy loam, brown (10YR 5/3) moist; weak medium subangular, angular and cylindrical blocky structure; few fine roots; common fine tubular pores; strong effervescence; moderately alkaline (pH 8.1); abrupt irregular boundary.
IIR	54"	Basalt bedrock.

IDAHO 5-58

Precip: 8-10"
Elevation: 4700'
Slope: E 18%

TOTAL ANNUAL YIELD 1958

Studies Based on 10 Random Estimated Plots

Species	1958 Lbs. Acre	1958 % Comp
Grasses		
Agropyron spicatum	292	34
Stipa thurberiana	153	18
Poa secunda	42	5
Koeleria cristata	6	1
Forbs		
Balsamorhiza sagittata	179	21
Penstemon spp.	38	4
Phlox hoodii	17	2
Crepis acuminata	13	1
Lomatium triternatum	10	1
Phlox longifolia	7	1
Other Forbs 1/	15	2
Annuals		
Bromus tectorum	T	T
Other Annuals 2/	T	T
Woody Plants		
Artemisia tridentata	40	5
Artemisia tripartita	25	3
Eriogonum spp.	9	1
Purshia tridentata	8	1
Total Annual Yields	854	100
Total Estimated Litter 3/	1560	

1/ Other forbs include Allium acuminatum, Antennaria dimorpha, Calochortus nitidus, Erigeron pumilus and Zigadenus paniculatus.

2/ Other annuals include Collinsia parviflora and Collomia tenella.

3/ Total estimated litter includes humic mulch.

11/26/69 V.K.H.

ROSEWORTH SILT LOAM (ORTHIDIC DURIXEROLL)

FIELD NO: Idaho 6-58 LABORATORY NO: S-58 Idaho 39-6

ELEVATION: 4720' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, northside of the Little Crater Kipuka, 21 miles northwest of American Falls, SW¼, Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Sloping and rolling upland, Snake River Plain, 19 percent north-facing slope.

CLASSIFICATION: Roseworth silt loam, a member of the fine-loamy, mixed, frigid family of ORTHIDIC DURIXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: The Roseworth series is defined as having a fine-loamy control section, more than 18 percent clay and more than 15 percent coarser than very fine sand, including coarse fragments up to 7.5 c.m. Laboratory data show this pedon as having 17.9 percent clay and less than 15 percent coarser than very fine sands. However, pebbles discarded at time of sampling are considered sufficient to qualify this pedon as having a fine-loamy control section.

This soil is characterized by a neutral to mildly alkaline, mollic epipedon, a mildly alkaline B horizon, a moderately alkaline calcic horizon, and a duripan at a depth of 37 inches.

Approximately 58 percent of the ground surface is bare, 8 percent is covered by stones and 34 percent is covered by vegetation and/or litter. Bare surface soils are slightly lighter in color than surface soils under vegetation and crack upon drying. Cracks, 1-2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

Cicada nymph burrowing is extensive in this soil. Soil structure in the B2, B3ca and C1ca horizons has been influenced by their activity.

Roots of bearded bluebunch wheatgrass observed to a depth of 37 inches.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A1 0-3" (Under grass) Dark grayish brown (10YR 4/2) light silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial pores; neutral (pH 7.0); common fine basalt pebbles; clear smooth boundary.

B1 3-8" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine tubular pores; mildly alkaline (pH 7.4); common basalt pebbles; gradual smooth boundary.

B2 8-19" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic breaking to moderate medium and fine subangular, angular and cylindrical blocky structure; hard; friable; nonsticky, slightly plastic; common fine roots; common fine and very fine tubular pores; mildly alkaline (pH 7.5); common basalt pebbles; abrupt wavy boundary.

B3ca 19-25" Very pale brown (10YR 8/3) silt loam, brown (10YR 5/3) moist; strong, medium and fine angular, subangular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; common fine roots mostly between soil peds; few fine tubular pores; strong effervescence; moderately alkaline (pH 8.1); common basalt pebbles; gradual wavy boundary.

C1ca 25-37" Very pale brown (10YR 8/3) silt loam, brown (10YR 5/3) moist; strong medium and fine angular, subangular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; common fine roots mostly between soil peds; few fine tubular pores; strong effervescence; moderately alkaline (pH 8.3); abrupt wavy boundary.

C2sicam 37-46" Pinkish white (7.5YR 8/2) duripan, light brown (7.5YR 6/4) moist; duripan contains thin lenses and pockets of pink (7.5YR 5/4) fine sandy loam soil material containing many fine roots and fragments of duripan; common basalt stones; strongly alkaline (pH 8.8); abrupt irregular boundary.

IIR 46" Basalt bedrock.

IDAHO 6-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20 Random Estimated Plots[1/]

Precip: 8-10"
Elevation: 4720'
Slope: N 19%

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp
Grasses																				
Agropyron spicatum	248	28	150	25	229	26	167	29	221	31	251	23	392	42	326	45	222	32	325	27
Poa secunda	82	9	43	7	163	19	68	12	186	26	325	30	53	6	89	12	18	2	52	4
Stipa thurberiana	117	13	70	12	55	6	37	6	35	5	35	3	58	6	74	10	60	9	221	18
Other Grasses 2/	15	2	-	-	8	1	2	T	-	-	3	T	-	-	1	T	-	-	2	T
Forbs																				
Balsamorhiza sagittata	106	12	84	14	85	10	59	10	40	5	75	7	66	7	60	8	202	29	187	15
Penstemon spp.	70	8	57	10	79	9	48	8	73	10	101	9	83	9	38	5	15	2	98	8
Crepis acuminata	74	8	28	4	30	4	8	1	5	1	22	2	82	9	16	2	5	1	39	3
Phlox hoodii	39	4	24	5	25	3	13	2	19	3	23	2	72	8	41	7	20	3	38	3
Phlox longifolia	13	1	17	3	23	3	16	3	15	2	36	3	40	4	5	1	15	2	30	3
Lomatium triternatum	11	1	4	1	22	3	20	3	11	1	34	3	8	1	3	T	1	T	12	1
Allium acuminatum	7	1	8	1	12	1	17	3	1	T	10	1	3	T	1	T	-	-	29	2
Other Forbs 3/	16	2	17	3	60	7	50	9	35	5	60	6	7	1	12	2	3	T	31	3
Annuals																				
Bromus tectorum	T	T	2	T	1	T	8	1	2	T	12	1	2	T	2	T	-	-	2	
Other Annuals 4/	T	T	T	T	1	T	T	T	6	1	T	T	3	T	T	T	-	-	4	1
Woody Plants																				
Artemisia tridentata	58	6	62	10	51	6	46	8	29	4	40	4	9	1	-	-	22	3	89	7
Artemisia tripartita	18	2	30	5	21	1	15	3	38	5	32	3	33	3	33	5	108	15	43	4
Chrysothamnus viscidiflorus	17	2	-	-	4	T	9	2	8	1	29	3	32	3	22	3	11	2	22	2
Opuntia polyacantha	-	-	-	-	10	1	-	-	-	-	1	T	-	-	-	-	-	-	2	T
Purshia tridentata	6	1	-	-	-	-	T	T	T	T	-	-	T	T	-	-	-	-	-	-
Total Annual Yields	897	100	596	100	879	100	583	100	724	100	1089	100	943	100	723	100	702	100	1226	100
Total Estimated Litter 5/	1512		1850		1495		722		839		800		737		679		1121		1035	

1/ 10 plots estimated in 1958.
2/ Other grasses include Koeleria cristata, Poa nevadensis, Sitanion hystrix and Stipa comata.
3/ Other forbs include Agoseris glauca, Antennaria dimorpha, Astragalus convallarius, Calochortus nitidus, Castilleja longispica, Crepis occidentalis, Delphinium nelsoni, Eriogonum spp., Fritillaria pudica, Lomatium macdougali, Mertensia oblongifolia and Zigadenus paniculatus.
4/ Other annuals include Collinsia parviflora and Collomia tenella.
5/ Total estimated litter, 1958, 1959 and 1960 includes humic mulch.

11/26/69 V.K.H.

TREVINO EXTREMELY STONY SILT LOAM (LITHIC XEROLLIC CAMBORTHID)

FIELD NO: Idaho 12-58

ELEVATION: 4700' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, 21 miles northwest of American Falls, south rim of Little Crater Kipuka, SW¼, Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Sloping and rolling upland, Snake River Plain, 11 percent south-facing slope.

CLASSIFICATION: Trevino extremely stony silt loam, a member of the loamy, mixed, mesic family of LITHIC XEROLLIC CAMBORTHIDS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This soil is characterized by a neutral ochric epipedon and a neutral to moderately alkaline, cambic horizon. Bedrock, porous basalt, occurs at a depth of 18 inches. Soil is relatively free of stones in the cambic horizon. Crystal pendants of opal occurred between the upper layers of basalt.

Approximately 66 percent of the ground surface is covered by basalt stones, 15 percent is bare and 19 percent is covered by vegetation and/or litter.

Roots of Thurbers needlegrass, bearded bluebunch wheatgrass and Sandberg bluegrass were were confined to the 18 inches of soil, but big sagebrush entered the upper layers of basalt.

PEDON: Pedon is described under near potential native vegetation. Color is for dry soil unless otherwise stated.

A11	0-7"	Light brownish gray (10YR 6/2) extremely stony silt loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; soft; friable; nonsticky, slightly plastic; common medium and fine roots; many medium and fine vesicular and interstitial pores; neutral (pH 7.3); 60 percent stones concentrated on the soil surface; clear wavy boundary.
B1	7-17"	Light brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak coarse and very coarse prismatic breaking to moderate medium and fine subangular blocky structure; slightly hard; friable; nonsticky, slightly plastic; common medium and fine roots; common medium and fine tubular pores; neutral (pH 7.3); common fine basalt pebbles; abrupt wavy boundary.
B2	17-18"	Pale brown (10YR 6/3) silt loam; dark brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; hard; friable; nonsticky, slightly plastic; common medium and fine roots; many medium and fine tubular pores; moderately calcareous; moderately alkaline (pH 7.9); common fine basalt pebbles; abrupt wavy boundary.
IIR	18" +	Bedrock, porous basalt.

IDAHO 12-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20 Random Estimated Plots 1/

Precip: 8-10"
Elevation: 4700'
Slope: S 11%

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp
Grasses																				
Agropyron spicatum	122	26	120	23	150	26	113	24	142	19	147	29	158	22	175	29	126	52	215	34
Poa secunda	101	21	42	8	95	17	60	13	184	24	58	11	144	20	114	19	18	8	60	10
Stipa thurberiana	87	18	75	14	53	9	47	10	49	6	45	9	83	12	82	14	28	12	139	22
Sitanion hystrix	-	-	2	T	9	2	2	T	3	T	1	T	5	1	15	3	1	T	5	1
Forbs																				
Balsamorhiza sagittata	41	9	49	9	36	6	13	3	15	2	36	7	62	9	95	16	31	13	-	-
Crepis acuminata	43	9	40	8	38	7	29	6	31	4	8	2	88	12	16	3	9	4	50	8
Phlox longifolia	5	1	26	5	22	4	16	3	22	3	20	4	17	2	16	3	9	4	28	5
Lomatium macdougali	-	-	12	2	18	3	16	3	38	5	7	1	29	4	4	1	2	T	28	5
Eriogonum ovalifolium	5	1	2	T	10	2	10	2	27	4	9	2	8	1	1	T	3	1	20	3
Erigeron pumilus	2	T	4	1	3	T	7	2	5	1	13	3	11	2	3	T	T	T	8	1
Other Forbs 2/	2	T	22	4	31	5	35	8	41	5	18	4	9	1	2	T	-	-	10	2
Annuals																				
Bromus tectorum	T	T	18	3	8	1	3	1	28	4	37	7	35	5	32	5	T	T	8	1
Other Annuals 3/	-	-	5	1	1	T	T	T	2	T	T	T	1	T	-	-	-	-	2	1
Woody Plants																				
Artemisia tridentata	72	15	117	22	100	18	115	25	175	23	106	21	66	9	42	7	15	6	43	7
Purshia tridentata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	1
Leptodactylon pungens	2	T	-	-	-	-	-	-	2	T	-	-	-	-	-	-	-	-	-	-
Total Annual Yields	482	100	534	100	574	100	466	100	764	100	505	100	716	100	597	100	242	100	625	100
Total Estimated Litter 4/	890		990		867		545		663		604		802		562		452		319	

1/ 10 plots estimated in 1958.

2/ Other forbs include Agoseris glauca, Allium acuminatum, Antennaria dimorpha, Astragalus spp., Calochortus nitidus, Castilleja longispica, Chaenactis douglasii, Delphinium nelsoni, Eriogonum spp., Lomatium triternatum, Mertensia oblongifolia, Phlox hoodii and Zigadenus paniculatus.

3/ Other annuals include Collinsia parviflora and Cryptantha spp.

4/ Total estimated litter, 1958, 1959 and 1960 includes humic mulch.

11/26/69 V.K.H.

TREVINO EXTREMELY STONY SILT LOAM (LITHIC XEROLLIC CAMBORTHID)

FIELD NO: Idaho 13-58

ELEVATION: 4740' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, 21 miles northwest of American Falls on the north rim of the Little Crater Kipuka, SW¼, Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Sloping and rolling upland, Snake River Plain, 13 percent north-facing slope.

CLASSIFICATION: Trevino extremely stony silt loam, a member of the loamy, mixed, mesic family of LITHIC XEROLLIC CAMBORTHIDS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: Soil is characterized by a neutral, ochric epipedon and a neutral, cambic horizon. Bedrock, porous basalt, occurs at a depth of 19 inches. The cambic horizon is relatively free of stones.

Approximately 58 percent of the ground surface is covered by stones; 15 percent by vegetation and/or litter; and 27 percent is bare.

Roots of Sandberg bluegrass, bearded bluebunch wheatgrass and Thurber needlegrass are principally confined to the 19 inches of soil. Roots of big sagebrush extended into the upper layers of the porous basalt.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11 0-2" (Under vegetation) Light brownish gray (10YR 6/2) extremely stony silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many interstitial pores; neutral (pH 6.7); 50 percent basalt stones concentrated on the soil surface; clear smooth boundary.

A12 2-6" Light brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium platy structure; slightly hard; friable; nonsticky, slightly plastic; many medium and fine roots; common medium and fine tubular pores; neutral (pH 7.0); clear smooth boundary.

B2 6-19" Light brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak to moderate medium subangular and angular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many medium and fine roots; common medium and fine tubular pores; neutral (pH 7.3); abrupt wavy boundary.

IIR 19" Bedrock, porous basalt.

IDAHO 13-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20 Random Estimated Plots 1/

Precip: 8-10"
Elevation: 4740'
Slope: N 13

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp
Grasses																				
Agropyron spicatum	176	23	91	16	126	17	91	18	173	22	173	26	108	17	206	42	160	41	232	28
Poa secunda	118	15	56	10	125	17	83	16	212	27	168	25	71	11	59	12	26	6	145	18
Stipa thurberiana	109	15	61	10	76	10	33	6	36	5	24	4	41	7	44	9	23	6	104	12
Sitanion hystrix	-	-	-	-	6	1	2	T	2	T	2	T	3	T	3	1	-	-	-	-
Stipa comata	-	-	-	-	-	-	-	-	3	T	5	1	-	-	-	-	-	-	-	-
Forbs																				
Balsamorhiza sagittata	132	17	101	17	116	16	63	12	72	9	13	2	24	4	74	15	69	18	37	4
Crepis acuminata	70	9	93	16	77	10	22	4	34	4	5	1	101	16	25	6	5	1	41	5
Phlox longifolia	6	1	24	4	27	4	14	3	20	3	26	4	35	6	28	6	8	2	46	5
Penstemon spp.	-	-	17	3	7	1	3	T	7	1	37	5	28	4	1	T	24	6	4	T
Lomatium triternatum	-	-	8	1	17	2	15	3	12	2	T	T	3	T	3	1	-	-	9	1
Calochortus nitidus	2	T	-	-	7	1	6	1	5	1	9	1	2	T	T	T	-	-	37	4
Other Forbs 2/	18	2	18	3	40	5	49	10	39	5	33	5	55	9	17	4	16	4	43	5
Annuals																				
Bromus tectorum	-	-	5	1	4	1	4	1	8	1	1	T	5	1	1	T	-	-	3	
Other Annuals 3/	-	-	2	T	2	T	2	T	T	T	T	T	1	T	1	T	-	-	7	1
Woody Plants																				
Artemisia tridentata	136	18	109	18	96	13	111	22	137	18	178	26	147	24	21	4	43	13	130	16
Purshia tridentata	-	-	-	-	18	2	18	4	13	2	-	-	-	-	-	-	-	-	-	-
Chrysothamnus viscidiflorus	-	-	4	1	3	T	2	T	-	-	-	-	2	T	-	-	13	3	12	1
Other Woody Plants 4/	-	-	-	-	-	-	-	-	-	-	T	T	5	1	-	-	2	T	4	T
Total Annual Yields	767	100	589	100	747	100	518	100	773	100	674	100	631	100	483	100	389	100	854	100
Total Estimated Litter 5/	1400		1370		1241		1005		1274		990		901		536		555		585	

1/ 10 plots estimated in 1958.
2/ Other forbs include Agoseris glauca, Allium acuminatum, Antennaria dimorpha, Astragalus purshii, Castilleja longispica, Delphinium nelsoni, Erigeron pumilus, Eriogonum ovalifolium, Fritillaria pudica, Lomatium macdougali, Phlox hoodii and Zigadenus paniculatus.
3/ Other annuals include an unidentified mustard.
4/ Other woody plants include Eriogonum spp. Artemisia tripartita and Opuntia polyacantha.
5/ Total estimated litter, 1958, 1959 and 1960 includes humic mulch.

11/26/69 V.K.H.

UNNAMED EXTREMELY STONY SILT LOAM (~~CALCIORTHIDIC~~ LITHIC HAPLOXEROLL)

FIELD NO; Idaho 14-58

ELEVATION: 4715' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, northwest part of the Little Kipuka, 21 miles northwest of American Falls, SE¼, Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Gently sloping and rolling upland, Snake River Plain, 5 percent south-facing slope.

CLASSIFICATION: Unnamed extremely stony silt loam, a member of the loamy mixed, mesic family of ~~CALCIORTHIDIC~~ LITHIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is characterized by a mildly alkaline, mollic epipedon and a mildly alkaline, cambic horizon. Bedrock, basalt, occurs at a depth of 20 inches. Bedrock is fractured and contains many deep crevices.

About 18 percent of the ground surface is covered by stones, 41 percent by vegetation and/or litter and 41 percent is bare. Bare surface soil is slightly lighter in color than surface soil under vegetation and cracks upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few roots.

Cicada nymphs have directly influenced the structure of the B2 and Clca horizons.

This soil with its deep crevices provides a suitable environment for deep rooted plants such as antelope bitterbrush and big sagebrush.

PEDON: Pedon is described under potential vegetation. Color is for dry soil unless otherwise stated.

A1	0-3"	(Under grass) Grayish brown (10YR 5/2) stony, angular cobbly silt loam, very dark grayish brown (10YR 3/2) moist; weak fine platy structure; soft; friable; nonsticky, nonplastic; many fine roots; many fine interstitial pores; mildly alkaline (pH 7.6); clear smooth boundary.
A3	3-9"	Brown (10YR 5/3) stony silt loam, dark brown (10YR 3/2) moist; weak subangular blocky structure; soft; friable; nonsticky, nonplastic; many fine roots; many medium and fine tubular pores; mildly alkaline (pH 7.6); gradual smooth boundary.
B2	9-17"	Brown (10YR 5/3) silt loam, dark brown (10YR 4/3) moist; weak medium subangular, angular and cylindrical blocky structure; soft; friable; nonsticky, slightly plastic; many fine roots; many medium and fine tubular pores; mildly alkaline (pH 7.6); abrupt wavy boundary.
Clca	17-20"	Pale brown (10YR 6/3) stony silt loam, dark brown (10YR 4/3) moist; moderate medium and fine subangular, angular and cylindrical blocky structure; hard; firm; nonsticky, slightly plastic; common fine roots; many fine tubular pores; strong effervescence; carbonates as fine veins and coatings on basalt stones; mildly alkaline (pH 7.8); abrupt irregular boundary.
IIR	20"	Basalt bedrock.

IDAHO 14-58

TOTAL ANNUAL YIELDS 1958

Precip: 8-10"
Elevation: 4715'
Slope: S 4½%

Studies Based on 10 Random Estimated Plots

Species	1958 Lbs. Acre	1958 % Comp
Grasses		
Stipa thurberiana	136	20
Poa secunda	96	14
Agropyron spicatum	53	8
Sitanion hystrix	27	4
Koeleria cristata	5	1
Forbs		
Balsamorhiza sagittata	165	24
Penstemon spp.	23	3
Phlox longifolia	8	1
Allium acuminatum	5	1
Crepis acuminata	5	1
Lomatium spp.	2	T
Delphinium nelsoni	1	T
Annuals		
Bromus tectorum	7	1
Other Annuals	1	T
Woody Plants		
Artemisia tridentata	79	12
Purshia tridentata	48	7
Chrysothamnus viscidiflorus	18	3
Total Annual Yields	679	100
Total Estimated Litter _/	1555	

_/ Total estimated litter includes humic mulch.

12/2/69 V.K.H.

NEELEY SILT LOAM, MODERATELY DEEP OVER BEDROCK VARIANT (CALCIORTHIDIC HAPLOXEROLL)

FIELD NO: Idaho 15-58 LABORATORY NO: S-58 Idaho 39-15

ELEVATION: 4700' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, 21 miles northwest of American Falls near the middle of the "Little Kipuka", NW¼ of the SE¼, Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, one percent south-facing slope.

CLASSIFICATION: Neeley silt loam, moderately deep over bedrock variant, a member of the fine-silty, mixed, mesic family of CALCIORTHIDIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is similar to the Neeley series except it has more than 18 percent clay in the control section and by being truncated by bedrock at a depth of 36 inches. It is characterized by a neutral to mildly alkaline mollic epipedon, a mildly alkaline cambic horizon and a moderately alkaline calcic horizon.

Vegetation and litter cover approximately 40 percent of the ground surface and 60 percent is bare. Bare surface soil is slightly lighter in color than surface soil under vegetation and cracks upon drying. Cracks, 1 to 2 inches deep, form prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and few fine roots.

Cicada nymphs have been very active in this pedon and structure of the B1, B2, C1ca and C2ca horizons has been modified by their burrowing.

Roots of bearded bluebunch wheatgrass extended to bedrock as did Thurber needlegrass. Roots of Sandberg bluegrass grew to a depth of about 18 inches.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A11	0-2"	(Under grass) Grayish brown (10YR 5/2) silt loam, dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial pores; neutral (pH 7.3); clear smooth boundary.
A12	2-4"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine tubular pores; neutral (pH 7.3); gradual smooth boundary.
A3	4-8"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak, medium prismatic structure; slightly hard; friable; slightly sticky, slightly plastic; many medium and fine roots; many fine tubular pores; neutral (pH 7.3); gradual smooth boundary.
B1	8-14"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic breaking to moderate medium subangular, angular and cylindrical blocky structure; hard; friable; slightly sticky, plastic; common medium and fine roots; many fine tubular pores; mildly alkaline (pH 7.4); diffuse smooth boundary.
B2	14-21"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; strong medium subangular, angular and cylindrical blocky structure; very hard; firm; slightly sticky, plastic; common fine roots mostly between peds; many fine tubular pores; mildly alkaline (pH 7.7); abrupt irregular boundary.
C1ca	21-24"	Pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate medium subangular, angular and cylindrical blocky structure; very hard; firm; slightly sticky, plastic; few fine roots mostly between peds; many medium and fine tubular pores; strong effervescence; moderately alkaline (pH 8.1); gradual wavy boundary.
C2ca	24-35"	Light gray (10YR 7/2) clay loam, brown (10YR 5/3) moist; moderate medium subangular, angular and cylindrical blocky structure; very hard; firm; nonsticky, slightly plastic; few fine roots mostly between soil peds; common medium and fine tubular pores; strong effervescence; secondary carbonates as veins; moderately alkaline (pH 8.2); clear wavy boundary.
C3ca	35-36"	White (10YR 8/2) silt loam, light gray (10YR 7/2) moist; massive; extremely hard; very firm; nonsticky, nonplastic; few fine roots; few fine tubular pores; violent effervescence; weakly cemented with secondary carbonates; abrupt wavy boundary.
IIR	36"	Basalt bedrock.

IDAHO 15-58

TOTAL ANNUAL YIELDS 1958 - 1967

Repeat Studies Based on 20 Random Estimated Plots 1/

Precip: 8-10"
Elevation: 4700'
Slope: Leve

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp
Grasses																				
Stipa thurberiana	258	34	116	18	166	23	121	20	222	17	137	12	202	27	197	30	200	39	415	31
Agropyron spicatum	77	10	69	11	56	8	73	12	121	9	88	8	67	9	153	24	51	10	191	15
Poa secunda	42	6	24	4	95	13	30	5	252	19	134	12	22	3	34	5	18	3	42	3
Sitanion hystrix	33	4	17	3	10	1	8	1	13	1	19	2	14	2	4	T	10	2	52	4
Agropyron riparium	-	-	-	-	2	T	3	1	6	T	2	T	1	T	1	T	T	T	14	1
Forbs																				
Balsamorhiza sagittata	113	15	125	20	67	9	33	5	46	3	115	10	6	1	83	13	34	7	1	T
Phlox longifolia	5	1	21	3	24	3	23	4	66	5	42	4	32	4	10	2	6	1	18	1
Crepis acuminata	18	2	8	1	11	1	8	1	21	2	35	3	51	7	32	5	5	1	20	2
Penstemon spp.	21	3	10	2	17	2	19	3	61	5	2	T	3	T	7	1	1	T	6	T
Allium acuminatum	3	T	13	2	8	1	8	1	17	1	28	2	12	2	3	T	-	-	32	3
Mertensia oblongifolia	8	1	17	3	8	1	16	3	15	1	12	1	9	1	11	2	4	1	3	T
Delphinium nelsoni	-	-	2	T	25	3	18	3	18	1	16	1	4	T	1	T	-	-	3	T
Other Forbs 2/	9	1	12	2	54	8	40	7	18	2	38	3	2	T	3	T	T	T	5	T
Annuals																				
Bromus tectorum	T	T	18	3	19	3	21	4	293	22	352	30	153	20	53	8	T	T	154	12
Other Annuals 3/	4	T	12	2	12	2	3	T	14	1	5	T	2	T	3	T	-	-	10	1
Woody Plants																				
Artemisia tridentata	94	13	112	17	94	13	117	19	81	6	95	8	105	14	34	5	147	29	221	17
Artemisia tripartita	58	8	44	7	59	8	64	10	53	4	26	2	67	9	17	3	23	4	134	10
Chrysothamnus viscidiflorus	15	2	2	T	6	1	9	1	16	1	27	2	5	1	11	2	16	3	6	T
Chrysothamnus nauseosus	-	-	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Opuntia polyacantha	-	-	-	-	-	-	-	-	6	T	-	-	-	-	-	-	-	-	-	-
Total Annual Yields	758	100	632	100	733	100	614	100	1339	100	1173	100	757	100	657	100	515	100	1327	100
Total Estimated Litter 4/	1830		2045		1550		749		760		760		739		1026		956		852	

1/ 10 plots estimated in 1958 and 1959.
2/ Other forbs include Agoseris glauca, Antennaria dimorpha, Astragalus convallarius, Calochortus nitidus, Castilleja spp., Eriogonum ovalifolium, Fritillaria pudica, Lomatium macdougali, Lomatium triternatum, Penstemon speciosus, Phlox hoodii and Senecio integerrimus.
3/ Other annuals include Collinsia parviflora and Collomia tenella.
4/ Total estimated litter, 1958, 1959 and 1960, includes humic mulch.

12/2/69 V.K.H.

NEELEY SILT LOAM, DEEP OVER BEDROCK VARIANT (CALCIORTHIDIC HAPLOXEROLL)

FIELD NO: Idaho 1-59

ELEVATION: 4665' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, 21 miles northwest of American Falls in the south "Winter Kipuka", Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08'W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, one percent northeast slope.

CLASSIFICATION: Neeley silt loam, deep over bedrock variant, a member of the coarse-silty, mixed, mesic family of CALCIORTHIDIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is similar to the Neeley series except it is underlain by bedrock at a depth of 51 inches. It is characterized by a neutral, mollic epipedon, a neutral, cambic horizon and a moderately to strongly alkaline calcic horizon. Basalt cobbles and pebbles are scattered throughout the profile.

Cicada nymph burrowing is extensive and the soil structure of the B22, C1ca and C2ca horizons are modified by this activity.

Roots of big sagebrush were observed to extend into the crevices of the basalt bedrock. Roots of bearded bluebunch wheatgrass extend to a depth of 40 inches.

Approximately 63 percent of the ground surface is bare and 37 percent is covered by vegetation and/or litter. Bare surface soil is slightly lighter in color than surface soil under vegetation and cracks upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

PEDON: Pedon is described under near potential native vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine platy structure; soft; very friable; nonsticky, slightly plastic; many fine and medium roots; many fine and very fine interstitial and few medium and coarse tubular pores; neutral (pH 6.8 BTB); few angular basalt cobbles and pebbles; clear smooth boundary.
B21	4-9"	Brown (10YR 5/3) silt loam; dark brown (10YR 3/3) moist; weak, medium and coarse subangular blocky structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine medium and a few coarse tubular pores; neutral (pH 6.9 BTB); few angular basalt cobbles and pebbles; gradual smooth boundary.
B22	9-19"	Light brownish gray (10YR 6/2) silt loam; dark grayish brown (10YR 4/2) moist; strong medium angular, subangular and cylindrical blocky structure; very hard; firm; nonsticky, slightly plastic; many medium and fine roots mostly between peds; many very fine, fine, medium and a few coarse tubular pores; neutral (pH 6.6 BTB); few angular basalt pebbles and cobbles; clear wavy boundary.
C1ca	19-35"	Light gray (10YR 7/2) silt loam; brown (10YR 5/3) moist; strong medium angular subangular and cylindrical blocky structure; very hard; firm; nonsticky, slightly plastic; many medium and fine roots between peds; common fine, very fine and few coarse tubular pores; strongly effervescent; secondary carbonates disseminated and as coatings on basalt cobbles; moderately alkaline (pH 8.4 TB); diffused smooth boundary.
C2ca	35-46"	Very pale brown (10YR 8/3) stony silt loam; pale brown (10YR 6/3) moist; moderate medium and fine angular subangular and cylindrical blocky structure; hard; friable; nonsticky, slightly plastic; common medium and fine roots; many fine and very fine tubular pores; occasional krotovina; strongly effervescent; secondary carbonates disseminated, concretions and veins; strongly alkaline (pH 8.8 TB); approximately 30 percent basalt stones; diffused wavy boundary.
C3ca	46-51"	White (10YR 8/2) stony silt loam; light gray (10YR 7/2) moist; weak to moderate, medium platy structure; hard; firm; nonsticky, nonplastic; common medium and fine roots; common medium and fine tubular pores; strongly effervescent; secondary carbonates disseminated; strongly alkaline (pH 8.8 TB); abrupt irregular boundary.
IIR	51"	Bedrock.

IDAHO 1-59

TOTAL ANNUAL YIELDS 1959 - 1968

Repeat Studies Based on 20 Random Estimated Plots

Precip: 8-10"
Elevation: 4665'
Slope: SW 1%

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp	1968 Lbs. Acre	1968 % Comp
Grasses																				
Agropyron spicatum	144	23	150	21	130	22	176	21	228	24	141	19	208	32	98	22	250	21	114	17
Stipa thurberiana	77	12	65	9	53	9	91	11	140	15	128	17	135	21	68	15	232	19	146	23
Poa secunda	49	8	127	18	61	10	143	17	158	17	31	4	58	9	21	5	48	4	41	6
Sitanion hystrix	12	2	13	2	16	3	40	5	21	2	30	4	15	2	8	2	24	2	7	1
Poa nevadensis	1	T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Forbs																				
Balsamorhiza sagittata	110	18	146	20	93	16	116	14	122	13	100	13	113	17	42	9	230	19	113	17
Phlox longifolia	40	7	28	4	25	4	39	4	20	2	23	3	13	2	7	1	17	1	26	4
Lomatium triternatum	6	1	14	2	19	3	17	2	20	2	15	2	2	T	T	T	51	4	T	T
Crepis acuminata	3	T	2	T	3	1	14	1	13	1	24	3	17	3	4	1	38	3	3	T
Allium acuminatum	6	1	10	1	7	1	25	3	7	1	3	T	3	T	-	-	54	4	-	-
Phlox hoodii	8	1	10	1	6	1	7	1	8	1	18	2	3	T	5	1	7	1	2	T
Other Forbs 1/	30	5	25	4	35	6	40	5	38	4	13	2	2	T	1	T	2	T	2	T
Annuals																				
Bromus tectorum	T	T	5	1	6	1	5	T	50	5	5	1	4	1	-	-	9	1	18	.
Other Annuals 2/	1	T	3	T	-	-	1	T	1	T	4	T	T	T	-	-	5	T	-	-
Woody Plants																				
Artemisia tridentata	125	20	109	15	123	21	119	14	113	11	217	29	89	13	196	44	257	21	167	27
Artemisia tripartita	3	T	8	1	5	1	9	1	16	2	-	-	-	-	-	-	-	-	-	-
Chrysothamnus viscidiflorus	3	1	7	1	5	1	-	-	-	-	-	-	-	-	-	-	-	-	9	1
Opuntia polyacantha	3	1	-	-	2	T	7	1	2	T	4	1	1	T	1	T	-	-	4	1
Total Annual Yields	621	100	722	100	589	100	849	100	957	100	756	100	663	100	451	100	1224	100	652	100
Total Estimated Litter 3/	1863		1700		735		922		760		805		951		620		1118		664	

1/ Other forbs include Agoseris glauca, Antennaria dimorpha, Astragalus cibarius, Astragalus convallarius, Calochortus nitidus, Castilleja longispica, Delphinium nelsoni, Fritillaria pudica, Lactuca serriola, Lomatium macdougali, Mertensia oblongifolia, Penstemon speciosus.

2/ Other annuals include Collinsia parviflora, Cordylanthus ramosus, Microsteris gracilis and Orthocarpus luteus.

3/ Total estimated litter, 1959 and 1960, includes humic mulch.

12/2/69 V.K.H.

NEELEY SILT LOAM, MODERATELY DEEP OVER BEDROCK VARIANT (CALCIORTHIDIC HAPLOXEROLL)

FIELD NO: Idaho 2-59

ELEVATION: 4680' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, 21 miles northwest of American Falls in the north "Winter Kipuka", Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, one percent southwest-facing slope.

CLASSIFICATION: Neeley silt loam, moderately deep over bedrock variant, a member of the coarse-silty, mixed, mesic family of CALCIORTHIDIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is similar to the Neeley series except it is truncated by basalt bedrock at a depth of 37 inches. Pedon is characterized by a neutral, mollic epipedon, a neutral, cambic horizon and a moderately alkaline, calcic horizon.

Approximately 68 percent of the ground surface is bare, 27 percent is covered by vegetation and/or litter and 5 percent is covered by stones. Bare soil surfaces are slightly lighter in color than surface soil under vegetation and crack upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

Roots of bearded bluebunch wheatgrass and Thurber needlegrass penetrated to bedrock. Big sagebrush roots grew laterally on top of the bedrock and entered crevices.

Soil structure between 12-37 inches deep is modified by cicada nymph burrowing.

PEDON: Pedon is described under near potential native vegetation. Color is for dry soil unless otherwise stated.

A1	0-6"	Grayish brown (10YR 5/2) silt loam; very dark grayish brown (10YR 3/2) moist; weak medium and thin platy structure; soft; very friable; nonsticky, slightly plastic; many medium and fine roots; many fine and very fine interstitial and a few coarse tubular pores; neutral (pH 6.6 BTB); few scattered basalt cobbles and pebbles; clear smooth boundary.
A3	6-12"	Brown (10YR 5/3) silt loam; dark brown (10YR 3/3) moist; weak medium to coarse prismatic structure; slightly hard; friable; nonsticky, slightly plastic; many medium and fine roots; many fine, medium and few coarse tubular pores; neutral (pH 6.6 BTB); few scattered angular basalt cobbles and pebbles; diffused smooth boundary.
B2	12-24"	Pale brown (10YR 6/3) silt loam; brown (10YR 4/3) moist; weak medium and coarse prismatic breaking to moderate medium angular, subangular and cylindrical blocky structure; very hard; firm; slightly sticky, plastic; many medium and fine roots mostly between peds; many fine, very fine and few medium and coarse tubular pores; neutral (pH 6.6 BTB); few scattered angular basalt cobbles and pebbles; clear wavy boundary.
Cca	24-37"	Very pale brown (10YR 8/3) silt loam; pale brown (10YR 6/3) moist; moderate medium angular, subangular and cylindrical blocky structure; very hard; firm; nonsticky, slightly plastic; common medium and fine roots mostly between peds; many fine, very fine and few medium and coarse tubular pores; strongly effervescent; secondary carbonates disseminated and as veins and coatings on peds; moderately alkaline (pH 8.4 TB); abrupt irregular boundary.
IIR	37"	Bedrock.

IDAHO 2-59

TOTAL ANNUAL YIELDS 1959

Precip: 8-10"
Elevation: 4680'
Slope: SW 1%

Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp
Grasses		
Agropyron spicatum	87	14
Stipa thurberiana	83	14
Poa secunda	48	8
Sitanion hystrix	8	1
Forbs		
Balsamorhiza sagittata	144	23
Phlox longifolia	34	6
Viola beckwithii	22	4
Allium acuminatum	17	3
Mertensia oblongifolia	15	2
Castilleja longispica	12	2
Other Forbs 1/	34	6
Annuals		
Bromus tectorum	8	1
Other Annuals 2/	3	T
Woody Plants		
Artemisia tridentata	101	16
Chrysothamnus viscidiflorus	1	T
Total Annual Yields	617	100
Total Estimated Litter 3/	1235	

1/ Other forbs include Agoseris glauca, Antennaria dimorpha, Crepis acuminata, Delphinium nelsoni, Erigeron pumilus, Lomatium macdougali, Lomatium triternatum, Penstemon speciosus, and Phlox hoodii.

2/ Other annuals include Collinsia parviflora

3/ Total estimated litter includes humic mulch.

12/3/69 V.K.H.

Unnamed
~~LITKIP~~ COBBLY SILT LOAM, NONCALCAREOUS VARIANT
(~~ARADIC~~ LITHIC HAPLOXEROLL)

FIELD NO: Idaho 3-59

ELEVATION: 4665' NORMAL ANNUAL PRECIPITATION: 9" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Power County, Idaho, 21 miles northwest of American Falls, north "Winter Kipuka", SE¼, Sec. 24, T6S, R28E (BPM), 42° 52' N, 113° 08' W.

LAND FORM: Level and undulating upland, Snake River Plain. This pedon occupies a slight depression.

CLASSIFICATION: Litkip cobbly silt loam, noncalcareous variant, a member of the loamy-mixed, mesic family of ~~ARADIC~~ LITHIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and basalt.

REMARKS: This pedon is similar to the Litkip series except it is leached of carbonates. It is characterized by a neutral, mollic epipedon and a neutral B2 horizon. Basalt bedrock occurs at a depth of 17 inches and contains many cracks and crevices.

Approximately 62 percent of the ground surface is bare, 10 percent is covered by stones and 28 percent is covered by vegetation and/or litter.

Roots of big sagebrush and antelope bitterbrush spread laterally on top of the bedrock entering the deep cracks and fissures.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A1	0-5"	(Bare soil surface) Brown (10YR 5/3) cobbly silt loam, dark brown (10YR 3/3) moist; weak medium platy structure; soft; friable; nonsticky, slightly plastic; few fine roots; surface, 0 to 3 inches, cracks upon drying and cracks form a polygonal pattern and where pebbles, basalt, are present form a pattern with segregated coarse particles; many vesicular pores; neutral (pH 6.6); clear smooth boundary.
A3	5-12"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium prismatic breaking to moderate medium subangular and angular blocky structure; slightly hard; friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine tubular pores; neutral (pH 6.6); common angular basalt cobbles and pebbles; clear smooth boundary.
B2	12-17"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak medium prismatic breaking to moderate medium angular and subangular blocky structure; very hard; firm; slightly sticky, plastic; many medium and fine and few coarse roots; many fine tubular pores; neutral (pH 6.8); common angular basalt cobbles and pebbles; clear iregular boundary.
IIR	17"	Bedrock - fractured and containing many crevices.

IDAHO 3-59

Precip: 8-10"
Elevation: 4665'
Slope: Level

TOTAL ANNUAL YIELDS 1959 - 1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses						
Poa secunda	81	11	133	18	59	10
Sitanion hystrix	37	5	30	4	20	3
Stipa thurberiana	26	4	28	4	23	4
Agropyron riparium	5	1	1	T	2	T
Forbs						
Balsamorhiza sagittata	79	11	79	11	59	10
Lomatium macdougali	45	6	40	6	44	7
Viola beckwithii	32	4	8	1	12	2
Allium acuminatum	22	3	7	1	12	2
Ranunculus andersonii	-	-	7	1	13	2
Other Forbs 1/	12	2	40	6	50	8
Annuals						
Bromus tectorum	33	4	44	6	42	7
Other Annuals 2/	14	2	4	T	4	1
Woody Plants						
Purshia tridentata	168	23	149	20	125	21
Artemisia tridentata	151	20	135	18	100	16
Chrysothamnus nauseosus	25	3	33	4	38	6
Opuntia polyacantha	9	1	-	-	6	1
Total Annual Yields	739	100	738	100	609	100
Total Estimated Litter 3/	1477		1320		610	

1/ Other forbs include Agoseris glauca, Antennaria dimorpha, Arabis holboellii, Calochortus nitidus, Crepis acuminata, Delphinium nelsoni, Fritillaria lanceolata, Lomatium triternatum, Mertensia oblongifolia, Phlox longifolia, and Senecio integerrimus.

2/ Other annuals include Collinsia parviflora, Galium spp. and Gayophytum ramosissimum.

3/ Total estimated litter for 1959 and 1960 includes humic mulch.

11/10/69 V.K.H.

HOELZLE SILT LOAM, DEEP VARIANT (CALCIC ARGIXEROLL)

FIELD NO: Idaho 6-60

ELEVATION: 5010' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 42° F.

LOCATION: Gently sloping area near the center of the east side of the Carey Kipuka, Craters of the Moon National Monument, 26 miles, via road, east of Carey, Blaine County, Idaho. It is in Sec. 20, T1S, R24E (BPM), 43° 20' N, 113° 32' W.

LAND FORM: Snake River Plain, gently sloping and undulating upland, 4 percent southwest-facing slope.

CLASSIFICATION: Hoelzle silt loam, deep variant, a member of the fine, montmorillonitic, frigid family of CALCIC ARGIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess and basaltic ash and cinders.

REMARKS: This pedon is very similar to the soil described at study Idaho 17-58, except its argillic horizon is 15 inches deeper.

Cicada nymph burrowing down to a depth of 38 inches have directly influenced soil structure in the horizon between 9 and 38 inches.

Roots of Idaho fescue were observed to a depth of about 40 inches and threetip sagebrush roots to a depth of about 50 inches.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A11 0-3" (Bare area between vegetation) Brown (10YR 5/3) light silt loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; few fine roots; many fine, medium and coarse vesicular pores; slightly acid (pH 6.4 BTB); common fine basalt pebbles; surface cracks form a prominent polygonal pattern; clear smooth boundary.

A12 3-9" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak subangular blocky structure; soft; friable; nonsticky, slightly plastic; many roots; many medium and fine tubular pores; common fine basalt pebbles; slightly acid (pH 6.4 BTB); common krotovina; clear wavy boundary.

B1 9-17" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium, subangular angular and cylindrical blocky structure; hard; firm; slightly sticky, slightly plastic; many roots; common medium and fine tubular pores; common fine basalt pebbles; slightly acid (pH 6.4 BTB); diffuse smooth boundary.

B21 17-29" Brown (10YR 5/3) heavy silt loam, brown (10YR 4/3) moist; strong medium, angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; common roots; common medium and fine tubular pores; common fine basalt pebbles; slightly acid (pH 6.5 BTB); gradual smooth boundary.

B22 29-38" Brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; strong medium angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, slightly plastic; common roots; common medium and fine tubular pores; neutral (pH 6.8 BTB); few concretions and flakes of manganese; common basalt stones; abrupt wavy boundary.

IIB23t 38-42" Brown (10YR 5/3) silt clay, brown (10YR 4/3) moist; strong medium prismatic structure; extremely hard; very firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; ped surfaces strong effervescence, center of prisms noneffervescent; neutral (pH 7.0 BTB); common pebbles weathered basalt; common pressure faces; thin continuous clay films; common concretions and flakes of manganese; clear irregular boundary.

IIB24ca 42-54" Brown (10YR 5/3) silty clay, brown (10YR 4/3) moist; moderate medium prismatic structure; extremely hard; very firm; very sticky, very plastic; few roots between soil peds; few fine tubular pores; weak to strong effervescence; secondary carbonates as veins on ped surfaces; moderately alkaline (pH 8.4 TB); many concretions and flakes of manganese; moderate patchy clay films; common pressure faces; gradual wavy boundary.

IIB31ca 54-67" Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak medium prismatic structure; very hard; friable; sticky, plastic; few roots; common medium and fine tubular pores; slight to strong effervescence; secondary carbonates as veins and coatings on ped surfaces; strongly alkaline (pH 8.8 TB); common concretions and flakes of manganese; common weathered basalt pebbles and stones; diffuse smooth boundary.

IIB32ca 67-77" Brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; massive; hard; friable; sticky, plastic; few roots; common medium and fine tubular pores; strong effervescence; secondary carbonates as veins; strongly alkaline (pH 8.6 TB); many concretions and flakes of manganese; common weathered basalt pebbles and stones; diffuse smooth boundary.

IIICca 77-94" (Taken with soil auger) Brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; massive; soft; friable; slightly sticky, slightly plastic; 25 percent basalt pebbles (cinders); strong effervescence; strongly alkaline (pH 8.6 TB).

IVR 94" Basalt.

IDAHO 6-60

Precip: 12-14"
Elevation: 5010'
Slope: S SW 4%

TOTAL ANNUAL YIELDS 1960-1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses				
Festuca idahoensis	349	37	172	25
Koeleria cristata	61	7	50	7
Poa secunda	73	8	44	7
Agropyron spicatum	50	5	56	8
Stipa columbiana	43	5	47	7
Elymus cinereus	3	T	-	-
Carex filifolia	21	2	24	4
Forbs				
Astragalus filipes	44	5	20	3
Crepis acuminata	22	2	11	2
Lupinus leucophyllus	23	3	7	1
Lomatium triternatum	12	1	13	2
Calochortus nitidus	11	1	9	1
Allium acuminatum	4	T	9	1
Other Forbs 1/	25	3	22	3
Annuals				
Bromus tectorum	2	T	2	T
Other Annuals 2/	3	T	2	T
Woody Plants				
Artemisia tripartita	182	19	179	26
Chrysothamnus viscidiflorus	21	2	20	3
Total Annual Yields	949	100	687	100
Total Estimated Litter	1717		1363	

1/ Other forbs include Agoseris glauca, Astragalus convallarius, Delphinium nelsoni, Eriogonum ovalifolium, Mertensia oblongifolia, Microseris nutans, Phlox longifolia and Senecio integerrimus.

2/ Other annuals include Collinsia parviflora, Collomia tenella, Cordylanthus ramosus, Gayophytum racemosum and Microsteris gracilis.

11/10/69 V.K.H.

OLA GRAVELLY COARSE SANDY LOAM, DEEP VARIANT (PACHIC HAPLOXEROLL)

FIELD NO: Idaho 3-64

ELEVATION: 5060' NORMAL ANNUAL PRECIPITATION: 16" NORMAL ANNUAL TEMPERATURE: 41° F.

LOCATION: Approximately five miles north and 4.5 miles west of Fairfield, Camas County, Idaho. It is three miles north of the intersection of the Baseline Road and Three Mile Creek Road, NE¼ of the NE¼, Sec. 23, T1N, R13E (BPM), 43° 22' N, 114° 47' W.

LAND FORM: Pediment, steeply rolling foothill upland, 30 percent west-facing slope.

CLASSIFICATION: Ola gravelly coarse sandy loam, deep variant, a member of the coarse-loamy, mixed, frigid family of PACHIC HAPLOXEROLLS.

PARENT MATERIAL: Alluvium, colluvium and residuum, acid igneous rocks, granite, etc.

REMARKS: This pedon is similar to the Ola series, except it does not have a paralithic contact with partially decomposed granitic or other intrusive acid igneous bedrock between 20 and 40 inches deep. Soil is characterized by a slightly acid mollic epipedon, a medium acid cambic horizon and a medium acid C horizon.

Roots of beardless bluebunch wheatgrass were observed to a depth of 48 inches. Big sagebrush and rubber rabbitbrush roots were observed to extend below the bottom of the soil pit, 66 inches.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

O1	1-0"	(Under vegetation) Dark grayish brown (10YR 4/2) organic mulch containing considerable small quartz pebbles (60 percent) very dark brown, moist.
A11	0-11"	Dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak subangular blocky structure; very soft; very friable; nonsticky, nonplastic; many roots; many medium interstitial pores; slightly acid (pH 6.4 BTB); 20 percent fine angular quartz gravel; diffuse smooth boundary.
A12	11-19"	Dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft; friable; nonsticky, nonplastic; many roots; many medium interstitial pores; slightly acid (pH 6.4 BTB); 20 percent fine angular quartz gravel; common krotovina (rodent); diffuse smooth boundary.
B1	19-29"	Grayish brown (10YR 5/2) gravelly coarse sandy loam; dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft; friable; nonsticky, nonplastic; common roots; many medium and fine interstitial pores; slightly acid (pH 6.2 BTB); 20 percent fine angular quartz gravel; common krotovina (rodent); gradual smooth boundary.
B21	29-38"	Brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; massive; soft; friable; nonsticky, nonplastic; common roots; many medium and fine interstitial pores; medium acid (pH 5.8 BCP); 20 percent fine angular quartz gravel; common krotovina (rodent); diffuse smooth boundary.
B22	38-48"	Brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; massive; soft; friable; nonsticky, nonplastic; few roots; many medium and fine interstitial pores; medium acid (pH 5.8 BCP); 20 percent fine angular quartz gravel; common krotovina (rodent); gradual smooth boundary.
C1	48-60"	Light yellowish brown (10YR 6/4) gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft; friable; nonsticky, nonplastic; few roots; many medium and fine interstitial pores; medium acid (pH 5.6 BCP); 20 percent fine angular quartz gravel; diffuse smooth boundary.
C2	60-66"+	Light yellowish brown (10YR 6/4) gravelly coarse loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft; very friable; nonsticky, nonplastic; few roots; moderately acid (pH 5.6 BCP); 20 percent fine angular quartz gravel.

IDAHO 3-64

Precip: 14-16"
Elevation: 5060'
Slope: W 30%

TOTAL ANNUAL YIELDS 1964

Studies Based on 20 Random Estimated Plots

Species	1964 Lbs. Acre	1964 % Comp
Grasses		
Agropyron inerme	669	31
Melcia bulbosa	58	3
Forbs		
Balsamorhiza sagittata	885	40
Lupinus spp.	47	2
Lomatium triternatum	5	T
Mertensia oblongifolia	1	T
Annuals		
Bromus tectorum	8	T
Woody Plants		
Artemisia tridentata	375	17
Chrysothamnus nauseosus	140	6
Chrysothamnus viscidiflorus	15	1
Total Annual Yields	2203	100
Total Estimated Litter	4219	

11/10/69 V.K.H.

HOELZLE EXTREMELY STONY SILT LOAM (ARIDIC CALCIC ARGIXEROLL)

FIELD NO: Idaho 1-66

ELEVATION: 5800' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 45° F.

LOCATION: Owyhee County, Idaho, 7.2 miles north of the Idaho-Nevada state line, State Highway No. 51, and 1½ miles east on the Damon Trail, NE¼, Sec. 28, T15S, R3E (BPM), 42° 06' N, 116° 05' W.

LAND FORM: Sloping and undulating upland, 8 percent north-facing slope.

CLASSIFICATION: Hoelzle extremely stony silt loam, a member of the fine, montmorillonitic, frigid family of ARIDIC CALCIC ARGIXEROLLS.

PARENT MATERIAL: Residuum and some colluvium, basalt.

REMARKS: This pedon is characterized by a neutral to slightly alkaline, mollic epipedon, a moderately alkaline argillic horizon and a strongly alkaline calcic horizon. Numerous basaltic stones and cobbles occur throughout this profile. Pedon is underlain by bedrock at a depth of 34 inches.

Soil erodes readily when vegetation has been removed. This is illustrated by the Damon Trail wagon ruts.

PEDON: Described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-5"	Grayish brown (10YR 5/2) extremely stony silt loam, very dark grayish brown (10YR 3/2) moist; medium thin platy structure; soft; friable; nonsticky, nonplastic; many medium and fine roots; many fine interstitial and common vesicular pores; neutral (pH 7.0 CR); 40 percent basalt stones; gradual smooth boundary.
A12	5-8"	Grayish brown (10YR 5/2) extremely stony silt loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; soft; friable; nonsticky, slightly plastic; many fine roots; many fine tubular pores; mildly alkaline (pH 7.4 CR); 30 percent basalt stones; clear wavy boundary.
B2t	8-15"	Brown (7.5YR 5/2) stony clay, dark brown (7.5YR 4/2) moist; (PED dark brown (7.5YR 4/2) dark brown (7.5YR 3/2) moist); moderate medium prismatic breaking to strong medium angular blocky structure; extremely hard; firm; very sticky, very plastic; common fine roots between soil peds; few fine tubular pores; many pressure faces; thin continuous clay films; mildly alkaline (pH 7.8 PR); 10 percent basalt stones; clear wavy boundary.
B2tca	15-22"	Brown (10YR 5/3) stony clay, brown (10YR 4/3) moist; (PED brown (10YR 5/3) very dark brown (10YR 3/3) moist); moderate medium prismatic breaking to strong fine angular blocky structure; very hard; firm; very sticky, very plastic; common fine roots between peds; few fine tubular pores; strong effervescence; secondary carbonate as coatings on peds, coarse veins and coatings on undersides of stones; moderately alkaline (pH 8.4 TB); thin patchy clay films; 10 percent stones; gradual wavy boundary.
Cca	22-34"	Pale brown (10YR 6/3) stony silty clay loam, brown (10YR 5/3) moist; weak medium and coarse prismatic breaking to moderate medium and fine angular blocky structure; hard; friable; sticky, plastic; few fine roots between peds; vertical faces of prisms stained with organic matter; strong effervescence; secondary carbonates disseminated, coarse veins and as coatings on stones; many fine tubular pores; strongly alkaline (pH 8.6 TB); 20 percent stones and cobbles; abrupt irregular boundary.
R	34" +	Basalt.

IDAHO 1-66

TOTAL ANNUAL YIELDS 1966

Precip: 11-13"
Elevation: 5800'
Slope: N 8%

Studies Based on 20 Randon Estimated Plots

Species	1966 Lbs. Acre	1966 % Comp
Grasses		
Festuca idahoensis	197	40
Poa secunda	19	4
Agropyron saxicola	15	3
Forbs		
Penstemon spp.	6	1
Phlox longifolia	3	1
Astragalus spp.	2	T
Eriogonum ovalifolium	2	T
Erigeron pumilus	2	T
Balsamorhiza hookeri	1	T
Allium spp.	1	T
Annuals		
Bromus tectorum	T	T
Woody Plants		
Artemisia arbuscula var. nova	248	50
Chrysothamnus viscidiflorus	4	1
Total Annual Yields	500	100
Total Estimated Litter	920	

11/24/69 V.K.H.

ROSEWORTH SILT LOAM (ORTHIDIC DURIXEROLL)

FIELD NO: Idaho 7-58

ELEVATION: 5400' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 43° F.

LOCATION: Twin Falls County, Idaho, 10 miles north of Roseworth and 1¼ miles west of Cedar Creek Reservior. The study is within an area fenced for dry farming, NE¼, NW¼, Sec. 4, T14S, R13E (BPM), 42° 23' N, 114° 52' S. Study is 175 feet south and 135 feet west of the NE corner of the NW¼ Sec. 4.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, one percent north-facing slope.

CLASSIFICATION: Roseworth silt loam, a member of the fine-loamy, mixed, frigid family of ORTHIDIC DURIXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: The bare surface soil is slightly lighter in color than surface soil under vegetation and cracks upon drying. Cracks form a prominent polygonal pattern. Polygons have weak thin platy structure and contain a few fine roots and many vesicular pores. Approximately 50 percent of the soil surface is bare.

This soil is characterized by a neutral, mollic epipedon, a neutral to mildly alkaline cambic horizon, a moderately alkaline calcic horizon, and a duripan.

Cicada nymph burrowing is very evident and soil structure between a depth of 10 to 25 inches is largely a product of their activity.

Stones and pebbles of basalt occur throughout the soil. Roots of big sagebrush extended below the bottom of the soil pit, 30 inches, into bedrock crevices.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-4"	(Under grass) Grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial and common medium and fine tubular pores; neutral (pH 6.7); clear smooth boundary.
B1	4-10"	Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium and coarse prismatic structure; slightly hard; friable; slightly sticky, plastic; many medium and fine roots; common medium and fine tubular pores; neutral (pH 6.7); gradual smooth boundary.
B2	10-14"	Pale brown (10YR 6/3) heavy silt loam, dark brown (10YR 4/3) moist; moderate medium, angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; common medium and fine roots; common medium and fine tubular pores; neutral (pH 6.7); clear wavy boundary.
C1ca	14-17"	Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate medium angular, subangular, and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; common medium and fine roots mostly between peds; few fine and medium tubular pores; strong effervescence; secondary carbonates disseminated and as coatings on pebbles and stones; mildly alkaline (pH 7.4); gradual wavy boundary.
C2ca	17-25"	Very pale brown (10YR 8/3) silt loam, brown (10YR 5/3) moist; moderate medium, angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, plastic; common medium and fine roots mostly between peds; few fine and very fine tubular pores; violent effervescence; secondary carbonates disseminated and as concretions; moderately alkaline (pH 8.0); common fragments of duripan; clear irregular boundary.
C3sicam	25-30"	White (10YR 8/2) strongly cemented duripan, very pale brown (10YR 7/3) moist; thick platy with massive very fine sandy loam soil materials between strongly cemented lenses; many fine roots between plates; violent effervescence; top of cemented lenses have trowled surfaces; strongly alkaline (pH 8.5); abrupt irregular boundary.
IIR	30"	Bedrock.

IDAHO 7-58

Precip: 12-14"
Elevation: 5400'
Slope: N 1%

TOTAL ANNUAL YIELDS 1958

Studies Based on 10 Random Estimated Plots

Species	1958 Lbs. Acre	1958 % Comp
Grasses		
Agropyron spicatum	450	64
Poa secunda	45	6
Agropyron riparium	13	2
Sitanion hystrix	9	1
Forbs		
Lupinus spp.	96	14
Crepis acuminata	17	2
Phlox longifolia	9	1
Balsamorhiza hookeri	8	1
Penstemon spp.	4	1
Senecio integerrimus	2	T
Phlox hoodii	1	T
Annuals		
All Annuals	T	T
Woody Plants		
Artemisia tridentata	49	7
Chrysothamnus viscidiflorus	9	1
Total Annual Yields	712	100
Total Estimated Litter 1/	1614	

1/ Total estimated litter includes humic mulch.

ROSEWORTH SILT LOAM (ORTHIDIC DURIXEROLL)

FIELD NO: Idaho 8-58

ELEVATION: 5420' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 43° F.

LOCATION: Twin Falls County, Idaho, 10 miles north of Roseworth and 1¼ miles west of the Cedar Creek Reservoir. The study is within an area fenced for dry farming, NE¼ of the NW¼, Sec. 4, T14S, R13E (BPM), 42° 23' N, 114° 52' W. Study is 400 feet south and 125 feet west of the NE corner of the NW¼ Sec. 4.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, one percent north-facing slope.

CLASSIFICATION: Roseworth silt loam, a member of the fine-loamy, mixed, frigid family of ORTHIDIC DURIXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: Approximately 58 percent of the ground surface is bare and 42 percent is covered by vegetation and/or litter. Bare soil surface is slightly lighter in color than surface soil under vegetation. Bare soil surface, 0 to 2 inches, cracks upon drying and the cracks form a prominent polygonal soil surface pattern. Polygons have a thin platy structure and contain many vesicular pores and a few fine roots.

Cicada nymphs are very active in this profile. Soil structure between 13 and 25 inch depth is essentially a product of their burrowing.

Pebbles and stones occur throughout the profile.

This pedon is characterized by a mollic epipedon; a cambic horizon; a calcic horizon and a duripan.

PEDON: Pedon is described in natural vegetation somewhat less than potential. Color is for dry soil unless otherwise stated.

A11	0-3"	(Under grass) Grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial and common fine and medium tubular pores; neutral (pH 6.7); common fine pebbles; clear smooth boundary.
A12	3-6"	Grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and coarse prismatic structure; slightly hard; friable; slightly sticky, plastic; many medium and fine roots; many fine, medium and few coarse tubular pores; neutral (pH 6.7); clear smooth boundary.
B2	6-13"	Pale brown (10YR 6/3) heavy silt loam, brown (10YR 3/3) moist; weak coarse prismatic structure; very hard; friable; slightly sticky, plastic; common medium and fine roots; many medium and fine tubular pores; neutral (pH 7.0); clear wavy boundary.
C1ca	13-25"	Very pale brown (10YR 8/3) silt loam, pale brown (10YR 6/3) moist; moderate medium angular, subangular and cylindrical blocky structure; very hard; firm; nonsticky, slightly plastic; common medium and fine roots mostly between peds; common fine and very fine tubular pores; violent effervescence; secondary carbonates disseminated and as concretions; moderately alkaline (pH 8.0); common duripan fragments; abrupt irregular boundary.
C2sicam	25-36"	White (10YR 8/2) duripan, very pale brown (10YR 7/3) moist; thick platy with thin lenses of massive fine sandy loam material containing many fine roots between strongly cemented lenses; violently effervescence; secondary carbonates disseminated and in duripan; strongly alkaline (pH 8.5); top of cemented lenses have trowled surfaces; abrupt irregular boundary.
IIR	36"	Bedrock.

IDAHO 8-58

Precip: 12-14"
Elevation: 5420'
Slope: N 1%

TOTAL ANNUAL YIELDS 1958

Studies Based on 10 Random Estimated Plots

Species	1958 Lbs. Acre	1958 % Comp
Grasses		
Agropyron riparium	372	63
Poa secunda	79	13
Agropyron spicatum	60	10
Sitanion hystrix	21	4
Forbs		
Phlox longifolia	47	8
Balsamorhiza sagittata	5	1
Lupinus spp.	5	1
Senecio integerrimus	2	T
Woody Plants		
Artemisia tridentata	T	T
Total Annual Yields	591	100
Total Estimated Litter 1/	1003	

1/ Total estimated litter includes humic mulch.

11/25/69 V.K.H.

ROSEWORTH SILT LOAM (ORTHIDIC DURIXEROLL)

FIELD NO: Idaho 9-58 LABORATORY NO: S-58 Idaho 42-9

ELEVATION: 5400' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 43° F.

LOCATION: Twin Falls County, Idaho, 10 miles south of Roseworth and 1¼ miles west of the Cedar Creek Reservoir. The study is within an area fenced for dry farming. It is 575 feet south and 108 feet west of the NE corner of the NW¼, Sec. 4, T14S, R13E (BPM), 42° 23' N, 114° 52' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, one percent north-facing slope.

CLASSIFICATION: Roseworth silt loam, a member of a fine-loamy, mixed, frigid family of ORTHIDIC DURIXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: Approximately 60 percent of the ground surface is bare and 40 percent is covered by vegetation and/or litter. Bare surface soil is slightly lighter in color than surface soil under vegetation. The bare surface soil, 0-2 inches, cracks upon drying and the cracks form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

Laboratory data show this pedon as having less than 15 percent coarser than very fine sand. However, sufficient pebbles were discarded at the time of sampling that this soil will be considered as having a fine-loamy control section and within the range of the Roseworth series.

Roots of big sagebrush extended below the bottom of the soil pit, 44 inches, into bedrock crevices.

Cidada nymph burrowing has strongly influenced soil structure of the B2, C1ca and C2ca horizons.

Soil is characterized by a neutral, mollic epipedon, a neutral, cambic horizon, a moderately alkaline, calcic horizon and a duripan at a depth of 25 inches.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A1	0-3"	(Under grass) Grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many fine interstitial and few medium tubular pores; neutral (pH 6.8); common basalt stones and pebbles; clear smooth boundary.
A3	3-7"	Grayish brown (10YR 5/2) heavy silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; slightly hard; friable; slightly sticky, slightly plastic; many medium and fine roots; many medium and fine and few coarse tubular pores; neutral (pH 7.0); common basalt stones and pebbles; gradual smooth boundary.
B2	7-11"	Pale brown (10YR 6/3) light silty clay loam, dark brown (10YR 4/3) moist; moderate medium coarse prismatic breaking to moderate, medium and fine angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, plastic; common medium and fine roots; common medium and fine tubular pores; neutral (pH 7.3); common basalt stones and pebbles; scattered duripan fragments; clear wavy boundary.
C1ca	11-20"	White (10YR 8/2) silt loam, pale brown (10YR 6/3) moist; moderate medium and fine angular, subangular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; common fine roots; few medium and fine tubular pores; moderately alkaline (pH 8.0); violent effervescence; common basalt stones and pebbles; common duripan fragments; abrupt wavy boundary.
C2ca	20-25"	Pale brown (10YR 7/3) silt loam, pale brown (10YR 6/3) moist; massive; loose; very friable; nonsticky, nonplastic; many duripan fragments; common basalt stones and pebbles; moderately alkaline (pH 8.1); violent effervescence; common fine roots; abrupt irregular boundary.
C3sicam	25-34"	White (10YR 8/2) duripan, very pale brown (10YR 7/3) moist; Duripan occurs in layers with upper part of layers coated with thin lenses of opal-like material; many basalt stones and pebbles embedded in this duripan; strongly alkaline (pH 8.5); abrupt irregular boundary.
C4ca	34-44"	(This is not a continuous layer and occurs as pockets between the many basalt stones.) Very pale brown (10YR 7/3) stony sandy laom; brown (10YR 5/3) moist; massive; slightly hard; friable; nonsticky, nonplastic; few fine roots; abrupt irregular boundary.
IIR	44"	Basalt bedrock.

IDAHO 9-58

Precip: 12-14"
Elevation: 5400'
Slope: N 1%

TOTAL ANNUAL YIELDS 1958 - 1961

Repeat Studies Based on 20 Random Estimated Plots 1/

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses								
Agropyron spicatum	593	69	619	67	625	59	304	51
Poa secunda	88	10	41	4	139	13	64	11
Agropyron riparium	20	2	14	2	22	2	15	3
Sitanion hystrix	6	1	23	2	26	2	13	2
Agropyron saxicola	-	-	7	1	7	1	1	T
Elymus cinereus	-	-	4	T	11	1	-	-
Forbs								
Lupinus spp.	44	5	24	3	34	3	17	3
Phlox longifolia	16	2	24	3	27	3	18	3
Allium acuminatum	-	-	7	1	8	1	5	1
Crepis acuminata	15	2	-	-	4	T	-	-
Delphinium nelsoni	-	-	2	T	7	1	9	1
Other Forbs 2/	-	-	14	1	22	2	23	4
Annuals								
Bromus tectorum	-	-	1	T	6	1	T	T
Other Annuals 3/	T	T	8	1	13	1	12	2
Woody Plants								
Artemisia tridentata	76	8	122	13	87	8	104	17
Chrysothamnus viscidiflorus	6	1	19	2	17	2	12	2
Total Annual Yields	864	100	929	100	1055	100	597	100
Total Estimated Litter 4/	2001		1915		1570		876	

1/ 10 plots estimated in 1958.
2/ Other forbs include Agoseris glauca, Astragalus spp. Lomatium spp. Mertensia oblongifolia, Senecio integerrimus, and Viola beckwithii.
3/ Other annuals not identified.
4/ Total estimated litter, 1958, 1959 and 1960, includes humic mulch.

UNNAMED EXTREMELY STONY SILT LOAM (CALCIORTHIDIC HAPLOXEROLL)

FIELD NO: Idaho 10-58

ELEVATION: 5400' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 43° F.

LOCATION: Twin Falls County, Idaho, 10 miles south of Roseworth and 1¼ miles west of Cedar Creek Reservoir. It is within an area fenced out for dry farming. The study is 1050 feet south and 180 feet west of the NE corner of the NW¼, Sec. 4, T14S, R13E (BPM), 42° 23' N, 114° 52' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, one percent north-facing slope.

CLASSIFICATION: Unnamed extremely stony silt loam, a member of the loamy-skeletal, mixed, frigid family of CALCIORTHIDIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon resembles the Roseworth series except it does not have a duripan. It also was leached of carbonates deeper than typical Roseworth. Because carbonates have accumulated on stones in the B22 horizon this pedon was classified as Calciorthidic.

Cicada nymphs are very active in this soil and their burrowing has directly influenced soil structure of the B21 and B22 horizons.

Approximately 48 percent of the ground surface is bare, 11 percent is covered by stones and 41 percent is covered by vegetation and/or litter. Bare surface soil is slightly lighter in color than surface soil under vegetation and cracks upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have thin platy structure and contain many vesicular pores and a few fine roots.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A1 0-3" (Under grass) Grayish brown (10YR 5/2) extremely stony silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; many interstitial pores; many medium and fine roots; slightly acid (pH 6.3); many basalt stones and pebbles; clear smooth boundary.

A12 3-7" Grayish brown (10YR 5/2) very stony silt loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine tubular pores; neutral (pH 6.6); clear smooth boundary.

B21 7-16" Brown (10YR 5/3) stony, heavy silt loam, dark brown (10YR 3/3) moist; weak coarse prismatic breaking to moderate medium and fine subangular, angular and cylindrical blocky structure; hard; friable; slightly sticky, plastic; many medium and fine roots; many medium and fine tubular pores; neutral (pH 6.7); gradual irregular boundary.

B22 16-27" Pale brown (10YR 6/3) extremely stony silt loam, dark brown (10YR 4/3) moist; moderate medium and fine subangular, angular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; common medium and fine roots; many medium and fine tubular pores; carbonate accumulation on underside of stones; 40 percent angular cobbles and stones; slight effervescence in places; neutral (pH 7.2); abrupt irregular boundary.

IIR 27" Basalt bedrock.

IDAHO 10-58

Precip: 12-14"
Elevation: 5400'
Slope: N 1%

TOTAL ANNUAL YIELDS 1958

Studies Based on 10 Random Estimated Plots

Species	1958 Lbs. Acre	1958 % Comp
Grasses		
Agropyron spicatum	419	47
Poa secunda	126	14
Agropyron riparium	8	1
Forbs		
Lupinus spp.	109	12
Crepis acuminata	54	6
Phlox longifolia	27	3
Allium acuminatum	4	T
Annuals		
Bromus tectorum	T	T
Other Annuals	T	T
Woody Plants		
Artemisia tridentata	150	17
Chrysothamnus viscidiflorus	T	T
Total Annual Yields	897	100
Total Estimated Litter 1/	1840	

1/ Total estimated litter includes humic mulch.

11/25/69 V.K.H.

ROSEWORTH EXTREMELY STONY SILT LOAM, HEAVY SUBSOIL VARIANT
(ARADIC DURIXEROLL)

FIELD NO: Idaho 11-58 LABORATORY NO: S-58 Idaho 42-11

ELEVATION: 5400' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 43° F.

LOCATION: Twin Falls County, Idaho, 10 miles south of Roseworth and 2½ miles west of the Cedar Creek Reservoir. It is within an area fenced for dry farming, SW¼ of the NE¼, Sec. 5, T14S, R13E, 42° 23' N, 114° 52' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, 4 to 6 percent west-facing slope.

CLASSIFICATION: Roseworth extremely stony silt loam, heavy subsoil variant, a member of the clayey-skeletal, montmorillonitic, frigid family of ARADIC DURIXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is similar to the Roseworth series but contains more than 35 percent clay in the control section and, therefore, is a variant of this series.

Approximately 58 percent of the ground surface is bare, 13 percent is covered by stones and 29 percent is covered by vegetation and/or litter. Bare surface soil is slightly lighter in color than surface soil under vegetation and cracks upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

The pedon is characterized by a mildly alkaline to neutral, mollic epipedon, a neutral, silty clay argillic horizon, a moderately alkaline calcic horizon, and a duripan at a depth of 22 inches.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A1 0-4" (Under grass) Grayish brown (10YR 5/2) extremely stony silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and thin platy structure; soft; friable; nonsticky, slightly plastic; many roots; many fine interstitial pores; mildly alkaline (pH 7.4); clear smooth boundary.

B1 4-8" Brown (10YR 5/3) very stony silty clay loam, dark brown (10YR 3/3) moist; weak coarse prismatic structure; hard; friable; sticky, plastic; many medium and fine roots; common medium and fine tubular pores; neutral (pH 6.9); gradual smooth boundary.

B2t 8-15" Brown (10YR 5/3) very stony silty clay, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to moderate medium and fine subangular and angular blocky structure; very hard; friable; sticky, plastic; common roots between soil peds; common medium and fine tubular pores; 30 percent stones; neutral (pH 7.3); thin continuous clay films; clear wavy boundary.

B3ca 15-22" Very pale brown (10YR 7/3) very stony silty clay, brown (10YR 5/3) moist; moderate medium and fine angular and subangular blocky structure; very hard; friable; slightly sticky, plastic; common medium and fine roots; few fine tubular pores; strong effervescence; 30 percent stones; moderately alkaline (pH 7.9); thin patchy clay films; abrupt irregular boundary.

C1sicam 22-30" White (10YR 8/2) ruptic duripan, very pale brown (10YR 7/3) moist; pan occurs in layers with the upper part of each layer coated with opal-like material; between these layers roots were observed in lenses and pockets of pale brown (10YR 6/3) sandy loam material; violent effervescence; moderately alkaline (pH 8.3); clear irregular boundary.

C2ca 30-40" Pale brown (10YR 6/3) extremely stony, light silty clay loam; massive; loose; very friable; nonsticky, slightly plastic; few roots; strong effervescence; mildly alkaline (pH 7.8); abrupt irregular boundary.

IIR 40" Basalt bedrock.

IDAHO 11-58

Precip: 12-14"
Elevation: 5400'
Slope: W 5%

TOTAL ANNUAL YIELDS 1958 - 1961

Repeat Studies Based on 20 Random Estimated Plots 1/

Species	1958 Lbs. Acre	1958 % Comp	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses								
Agropyron spicatum	399	56	418	64	545	64	242	50
Poa secunda	76	11	38	6	102	12	43	9
Sitanion hystrix	-	-	3	T	5	1	3	1
Forbs								
Phlox longifolia	31	4	28	5	24	3	13	2
Lupinus spp.	13	2	1	T	10	1	3	1
Zigadenus paniculatus	-	-	3	T	6	1	9	2
Aster scopulorum	-	-	-	-	9	1	5	1
Allium acuminatum	-	-	2	T	6	1	2	T
Agoseris glauca	-	-	-	-	1	T	2	T
Other Forbs 2/	-	-	4	1	2	T	5	1
Annuals								
Bromus tectorum	-	-	T	T	-	-	-	-
Other Annuals 3/	T	T	10	2	4	T	4	1
Woody Plants								
Artemisia tridentata	196	27	148	22	138	16	157	32
Total Annual Yields	715	100	655	100	852	100	488	100
Total Estimated Litter 4/	1105		1018		1010		843	

1/ 10 plots estimated in 1958.
2/ Other forbs include Cymopterus spp., Delphinium spp., Lomatium triternatum and Phlox hoodii.
3/ Other annuals include Collinsia parviflora
4/ Total estimated litter, 1958, 1959 and 1960, includes humic mulch.

12/4/69 V.K.H.

NEWDALE SILT LOAM (CALCIORTHIDIC HAPLOXEROLL)

FIELD NO: Idaho 4-59 LABORATORY NO; S-59 Idaho 6-4

ELEVATION: 4920' NORMAL ANNUAL PRECIPITATION: 10" NORMAL ANNUAL TEMPERATURE: 45° F.

LOCATION: Bingham County, Idaho, approximately 16 miles north and 6 miles west of Blackfoot, in the "Morgan Pasture Kipuka", Sec. 13, T1N, R34E (BPM), 43° 27' N, 112° 28' W.

LAND FORM: Nearly level to gently sloping and undulating upland, Snake River Plain, one percent south-facing slope.

CLASSIFICATION: Newdale silt loam, a member of the coarse-silty, mixed, frigid family of CALCIORTHIDIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian, loess.

REMARKS: This soil is characterized by a slightly acid to neutral, mollic epipedon, a neutral, cambic horizon and a mildly to moderately alkaline calcic horizon. This pedon is slightly deeper to carbonates than is typical for the Newdale series.

Approximately 67 percent of the ground surface is bare and 33 percent is covered by vegetation and/or litter. Bare surface soils are slightly lighter in color than surface soils under vegetation and crack upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

Roots of bearded bluebunch wheatgrass extended to a depth of about 48 inches, Thurber needlegrass to about 36 inches and big sagebrush roots continued beyond the bottom of the soil pit, 72 inches.

Cicada nymph burrowing is extensive and soil structure of the B2, C1ca, and C2ca is directly influenced by them.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A1 0-4" (Under grass) Grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine interstitial and common medium and coarse tubular pores; slightly acid (pH 6.4); clear smooth boundary.

A3 4-15" Brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine tubular pores; neutral (pH 6.8); clear smooth boundary.

B2 15-26" Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate medium angular, subangular and cylindrical blocky structure; extremely hard; friable; slightly sticky, slightly plastic; common medium and fine roots mostly between peds; common fine tubular pores; neutral (pH 6.9); clear wavy boundary.

C1ca 26-44" Light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; moderate medium angular, subangular and cylindrical blocky structure; extremely hard; firm; slightly sticky, slightly plastic; common fine roots mostly between peds; common fine tubular pores; violent effervescence; secondary carbonate as veins and coatings on peds; mildly alkaline (pH 7.8); gradual smooth boundary.

C2ca 44-63" Light gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) moist; moderate medium angular, subangular, and cylindrical blocky structure; hard; friable; nonsticky, slightly plastic; few roots; common fine medium and coarse tubular pores; violent effervescence; secondary carbonate as veins, pockets and coatings on peds; moderately alkaline (pH 8.0); diffuse smooth boundary.

IIC3 63-72" + Pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; soft; friable; nonsticky, nonplastic; few medium and coarse roots; common fine tubular pores; strong effervescence; mildly alkaline (pH 7.8).

With a soil auger it was determined that the C3 horizon continued to a depth of 11 feet where basalt was encountered. Soil temperature recorded with maximum and minimum Taylor thermometer at 11 feet on August 18, 1959, was 54° F.

IDAHO 4-59

TOTAL ANNUAL YIELDS 1959 - 1968

Repeat Studies Based on 20 Random Estimated Plots

Precip: 9-11"
Elevation: 4920'
Slope: S 1%

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp	1964 Lbs. Acre	1964 % Comp	1965 Lbs. Acre	1965 % Comp	1966 Lbs. Acre	1966 % Comp	1967 Lbs. Acre	1967 % Comp	1968 Lbs. Acre	1968 % Comp
Grasses																				
Agropyron spicatum	234	34	305	40	245	40	275	33	220	28	394	45	287	52	179	50	230	22	277	51
Stipa thurberiana	103	15	85	11	80	13	72	9	64	8	82	9	88	15	54	15	158	15	41	7
Poa secunda	46	7	78	10	34	6	150	18	140	17	156	18	40	7	35	10	48	4	42	8
Sitanion hystrix	5	1	2	T	1	T	6	1	7	1	1	T	T	T	T	T	-	-	-	-
Koeleria cristata	-	-	2	T	-	-	-	-	-	-	-	-	-	-	-	-	7	1	-	-
Forbs																				
Phlox longifolia	23	3	14	2	13	2	36	4	51	6	52	6	8	1	3	1	18	2	4	1
Lomatium macdougali	31	5	29	4	25	4	56	7	15	2	-	-	-	-	-	-	19	2	1	T
Crepis acuminata	30	4	12	2	5	1	12	1	-	-	7	1	2	T	1	T	5	T	5	1
Crepis occidentalis	-	-	29	4	29	5	26	3	7	1	-	-	-	-	-	-	1	T	-	-
Allium acuminatum	6	1	9	1	8	1	13	2	15	2	6	T	2	T	-	-	7	1	-	-
Other Forbs 1/	35	5	30	4	25	4	30	3	24	3	15	2	3	1	1	T	3	T	4	1
Annuals																				
Bromus tectorum	-	-	-	-	-	-	-	-	15	2	T	T	T	T	1	T	3	T	4	1
Other Annuals 2/	T	T	7	1	1	T	21	2	5	T	9	1	4	1	T	T	23	2	3	1
Woody Plants																				
Artemisia tridentata	146	22	136	18	126	21	120	15	227	29	160	18	81	14	81	22	334	32	128	24
Artemisia tripartita	15	2	14	2	13	2	13	2	6	1	-	-	31	5	3	1	196	19	31	6
Chrysothamnus viscidiflorus	7	1	5	1	7	1	1	T	-	-	-	-	24	4	3	1	-	-	2	T
Total Annual Yields	681	100	757	100	612	100	831	100	796	100	882	100	570	100	361	100	1052	100	542	100
Total Estimated Litter 3/	1527	14	1420		957		950		885		575		750		726		834		641	

1/ Other forbs include Agoseris glauca, Allium acuminatum, Antennaria dimorpha, Aster scopulorum, Astragalus convallarius, Astragalus filipes, Calochortus nitidus, Delphinium nelsoni, Lactuca serriola, Lomatium triternatum, Mertensia oblongifolia, Microseris nutans, Phlox hoodii and Tragopogon dubius.
2/ Other annuals include Collinsia parviflora, Cordylanthus ramosus and Cryptantha spp.
3/ Total estimated litter, 1959 and 1960, includes humic mulch.

12/4/69 V.K.H.

NEWDALE SILT LOAM (CALCIORTHIDIC HAPLOXEROLL)

FIELD NO: Idaho 5-59

ELEVATION: 4920' NORMAL ANNUAL PRECIPITATION: 10" NORMAL ANNUAL TEMPERATURE: 46° F.

LOCATION: Bingham County, Idaho, 16 miles north and 6 miles west of Blackfoot, "Morgan Pasture Kipuka", Sec. 13, T1N, R34E (BPM), 43° 27' N, 112° 28' W.

LAND FORM: Nearly level to gently sloping and undulating upland, Snake River Plain, less than one percent south slope.

CLASSIFICATION: Newdale silt loam, a member of the coarse-silty, mixed, frigid family of CALCIORTHIDIC HAPLOXEROLLS.

PARENT MATERIAL: Eolian, loess.

REMARKS: This pedon is very similar to the pedon on study Idaho 4-59, except it is in a more level area and may receive some runoff from surrounding areas.

Roots of bearded bluebunch wheatgrass were observed to a depth of 40 inches, threetip sagebrush to 50 inches and big sagebrush roots extended below the bottom of the soil pit, 69 inches.

Approximately 58 percent of the ground surface is bare and 42 percent is covered by vegetation and/or litter.

Cicada nymph burrowing is extensive in this pedon and the soil structure of the horizons between the depths of 9 to 48 inches has been modified by their activity.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11 0-2" (Between plants) Grayish brown (10YR 5/2) silt loam; dark brown (10YR 3/3) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; few fine roots; many medium and fine vesicular pores; slightly acid (pH 6.2 BTB); soil cracks and cracks form a prominent polygonal pattern; clear smooth boundary.

A12 2-5" Brown (10YR 5/3) silt loam; dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft; very friable; nonsticky, slightly plastic; many medium and fine roots; many fine and medium interstitial and few coarse tubular pores; slightly acid (pH 6.2 BTB); clear wavy boundary.

A13 5-9" Brown (10YR 5/3) silt loam; dark brown (10YR 3/3) moist; weak coarse prismatic breaking to medium and fine subangular blocky structure; slightly hard; friable; slightly sticky, slightly plastic; many medium and fine roots; many medium fine and few coarse tubular pores; slightly acid (pH 6.2 BTB); clear smooth boundary.

B2 9-22" Brown (10YR 5/3) silt loam; dark brown (10YR 4/3) moist; strong, medium, angular, subangular and cylindrical blocky structure; very hard; friable; slightly sticky, slightly plastic; many fine roots mostly between peds; common fine and very fine tubular pores; neutral (pH 6.6 BTB); clear smooth boundary.

C1ca 22-33" Pale brown (10YR 6/3) silt loam; brown (10YR 5/3) moist; strong, medium angular, subangular and cylindrical blocky structure; very hard; firm; nonsticky, slightly plastic; common fine roots between peds; common fine, very fine and few medium tubular pores; strong effervescence, secondary carbonates as thin veins and soft spots; strongly alkaline (pH 8.6 TB); gradual smooth boundary.

C2ca 33-48" Very pale brown (10YR 7/3) silt loam; brown (10YR 5/3) moist; moderate medium angular, subangular and cylindrical blocky structure; hard; friable; slightly sticky, plastic; common medium and fine roots between peds; many fine, very fine and few medium tubular pores; violent effervescence; secondary carbonates disseminated and as soft spots; strongly alkaline (pH 9.0 TB); gradual wavy boundary.

C3 48-69" Very pale brown (10YR 7/3) silt loam; massive; soft; very friable; nonsticky, slightly plastic; few roots; many fine and very fine tubular pores; strong effervescence; strongly alkaline (pH 9.0 TB). Continuing with the soil auger, this horizon extended to 96 inches where many basalt cobbles and pebbles were encountered. The lime content appeared to increase with the cobbles and pebbles. At 101 inches basalt stones or bedrock was encountered. Soil temperature at 101 inches was 55.5° F. (Taylor maximum-minimum thermometer lowered into auger hole.)

IDAHO 5-59

Precip: 9-11"
Elevation: 4920'
Slope: S 1%

TOTAL ANNUAL YIELDS 1959

Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp
Grasses		
Agropyron spicatum	263	46
Poa secunda	57	10
Stipa thurberiana	40	7
Sitanion hystrix	7	1
Poa nevadensis	2	T
Carex filifolia	10	2
Forbs		
Crepis occidentalis	22	4
Phlox longifolia	17	3
Lomatium macdougali	14	3
Phlox hoodii	12	2
Agoseris glauca	8	1
Lomatium triternatum	5	1
Mertensia oblongifolia	5	1
Other Forbs 1/	6	1
Annuals		
All annuals 2/	8	1
Woody Plants		
Artemisia tripartita	72	13
Artemisia tridentata	20	4
Opuntia polyacantha	2	T
Total Annual Yields	570	100
Total Estimated Litter 3/	1847	

1/ Other forbs include Allium acuminatum, Antennaria dimorpha, Astragalus convallarius and Tragopogon dubius.

2/ Annuals include Collinsia parviflora and Hackelia patens.

3/ Total estimated litter includes humic mulch.

12/4/69 V.K.H.

BRUNT SILT LOAM (XEROLLIC NATRARGID)

FIELD NO: Idaho 6-59 LABORATORY NO: S-59 Idaho 6-6

ELEVATION: 4920' NORMAL ANNUAL PRECIPITATION: 10" NORMAL ANNUAL TEMPERATURE: 45° F.

LOCATION: Bingham County, Idaho, 16 miles north and 6 miles west of Blackfoot in the north end of the "Morgan Pasture Kipuka". It is in Sec. 13, T1N, R34E (BPM), 43° 27' N, 112° 28' W.

CLASSIFICATION: Brunt silt loam, a member of the fine-silty, mixed, frigid family of XEROLLIC NATRARGIDS.

LAND FORM: Nearly level to gently sloping, undulating upland, 2 percent east slop

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This soil is characterized with a slightly acid ochric epipedon, a thin slightly acid albic horizon, a neutral to moderately alkaline natric horizon and a moderately alkaline calcic horizon. This soil occurs as small disconnected areas intermingled with Newdale silt loam.

Approximately 74 percent of the soil surface is bare and 26 percent is covered by vegetation and/or litter. The areas of bare surface soil between plants have a puddled appearance and cracks upon drying. Cracks, 1 to 2 inches deep, form a prominent polygonal pattern. Polygons are larger than those formed on Newdale. Local areas with a supply of basalt pebbles frequently produce a pattern with segragated coarse particles. Surface soils under vegetation are slightly darker in color than the bare surface soils and contain many roots.

Roots of bottlebrush squirreltail were observed to extend to a depth of about 18 inches. Roots of big sagebrush grew laterally on top of the natric horizon entering vertical cleavage planes of columns. Roots were deformed, flattened, through this horizon.

PEDON: Pedon is described under near climax vegetation. Color is for dry soil unless otherwise stated.

A11	0-2"	(Bare surface soil) Light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft; very friable; nonsticky, slightly plastic; few roots; many medium and fine and few coarse vesicular pores; cracks upon drying and cracks form a prominent polygonal pattern; slightly acid (pH 6.5); abrupt smooth boundary.
A12	2-5"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak coarse prismatic structure; soft; very friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine interstitial and few coarse tubular pores; slightly acid (pH 6.3); clear smooth boundary.
A2	5-8"	Pale brown (10YR 6/3) light silt loam, dark brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard; friable; nonsticky, slightly plastic; many medium and fine roots; many fine, medium and few coarse tubular pores; slightly acid (pH 6.4); abrupt wavy boundary.
B2t	8-14"	Pale brown (10YR 6/3) heavy silt loam, dark brown (10YR 4/3) moist (PED dark brown (10YR 4/3) dry and moist); moderate coarse columnar structure; very hard; firm; slightly sticky, plastic; common fine roots mostly between peds; few fine tubular pores; neutral (pH 6.9); moderate patchy clay films; column faces stained with organic matter; common flakes of manganese; clear wavy boundary.
B3ca	14-20"	Pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate medium and fine angular and subangular blocky structure; very hard; firm; slightly sticky, plastic; common fine roots mostly between peds; few fine tubular pores; slight to strong effervescence; mildly alkaline (pH 7.8); thin patchy clay films; clear wavy boundary.
C1ca	20-39"	Very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; moderate medium and fine angular and subangular blocky structure; very hard; friable; nonsticky, slightly plastic; few roots; common fine tubular pores; violent effervescence; secondary carbonate as veins and soft pockets; moderately alkaline (pH 7.9); gradual wavy boundary.
C2ca	39-63"	Very pale brown (10YR 7/3) light silt loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft; very friable; nonsticky, nonplastic; few roots; many fine tubular pores; violent effervescence; secondary carbonate as veins and soft pockets; moderately alkaline (pH 8.1); gradual wavy boundary.
IIC3	63-72"	Pale brown (10YR 6/3) heavy silt loam, dark brown (10YR 4/3) moist; massive; slightly hard; friable; slightly sticky, slightly plastic; few roots; many fine tubular pores; strong effervescence; moderately alkaline (pH 8.1); common basalt stones; abrupt irregular boundary.
IIR	72"	Basalt.

IDAHO 6-59

Precip: 9-11"
Elevation: 4920'
Slope: E 2%

TOTAL ANNUAL YIELDS - 1959 - 1963

Repeat Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp	1962 Lbs. Acre	1962 % Comp	1963 Lbs. Acre	1963 % Comp
Grasses										
Poa secunda	38	13	66	17	45	14	162	28	192	32
Sitanion hystrix	66	22	63	17	47	14	109	19	68	11
Agropyron spicatum	25	8	48	13	49	15	59	10	44	7
Stipa thurberiana	5	2	4	1	7	2	4	1	5	1
Forbs										
Crepis occidentalis	16	5	27	7	37	12	20	3	9	2
Lomatium macdougali	7	2	25	7	18	6	27	5	7	1
Phlox longifolia	5	2	10	3	7	2	12	2	20	3
Allium acuminatum	3	1	12	3	4	1	14	2	3	T
Phlox hoodii	8	3	2	T	3	1	4	1	6	1
Aster scopulorum	6	2	-	-	3	1	9	1	5	1
Other Forbs 1/	7	2	8	2	6	2	11	2	10	2
Annuals										
Bromus tectorum	-	-	-	-	-	-	-	-	1	T
Other Annuals 2/	-	-	1	T	1	T	11	2	9	1
Woody Plants										
Artemisia tridentata	90	31	103	27	96	29	130	22	232	38
Opuntia polyacantha	4	1	10	3	5	1	10	2	-	-
Chrysothamnus viscidiflorus	11	4	2	T	1	T	1	T	-	-
Artemisia tripartita	6	2	-	-	1	T	3	T	-	-
Total Annual Yields	297	100	381	100	330	100	586	100	611	100
Total Estimated Litter 3/	890		689		341		389		510	

1/ Other forbs include Agoseris glauca, Antennaria dimorpha, Astragalus cibarius, Astragalus filipes, Calochortus nitidus, Castilleja longispica, Crepis acuminata, Mertensia oblongifolia and Tragopogon dubius.

2/ Other annuals include Cryptantha watsonii, Lappula spp. and Arabis spp.

3/ Total estimated litter for 1959 and 1960 includes humic mulch.

11/25/69 V.K.H.

ROSEWORTH VERY STONY SILT LOAM, SKELETAL VARIANT (ORTHIDIC DURIXEROLL)

FIELD NO: Idaho 11-59

ELEVATION: 5400' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 43° F.

LOCATION: Twin Falls County, Idaho, 1½ miles west of the Cedar Creek Reservoir on the Purshell Ranch. It is in the SE¼, Sec. 21, T13S, R13E (BPM), 42° 12' N, 114° 57' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, 2 percent west-facing slope.

CLASSIFICATION: Roseworth very stony silt loam, skeletal variant, a member of the loamy-skeletal, mixed, frigid family of ORTHIDIC DURIXEROLLS.

PARENT MATERIAL: Eolian and some residuum, loess and some basalt.

REMARKS: This pedon is similar to the Roseworth series except it is calcareous throughout and contains more than 35 percent coarse fragments in the control section.

About 68 percent of the ground surface is bare, 3 percent is covered by stones and 29 percent is covered by vegetation and/or litter. Bare surface soil is slightly lighter in color than surface soil under vegetation and cracks upon drying. Cracks, 1-2 inches deep, form a prominent polygonal pattern. Polygons have weak thin platy structure and contain many vesicular pores and a few fine roots.

Cicada nymph burrowing has directly modified the structure of the B2 and C1ca horizons.

Roots of bearded bluebunch wheatgrass were observed to enter the duripan. Big sagebrush roots moved laterally along the duripan entering fractures and continuing into the crevices of the bedrock.

PEDON: This pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A1 0-4" (Under grass) Grayish brown (10YR 5/2) very stony silt loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine platy structure; soft; friable; nonsticky, slightly plastic; many interstitial pores; many medium and fine roots; many basalt pebbles; neutral (pH 6.8 PR); slight effervescence in places but mostly noncalcareous; small fragments of duripan scattered over the surface; clear smooth boundary.

B2 4-17" Grayish brown (10YR 5/2) stony silt loam, very dark grayish brown (10YR 3/2) moist; moderate, medium subangular, angular and cylindrical blocky structure; very hard; friable; nonsticky, slightly plastic; many medium and fine roots; common medium and fine tubular pores; many basalt pebbles, strong effervescence; secondary carbonates coatings on underside of stones; moderately alkaline (pH 8.4 TB); abrupt irregular boundary.

C1ca 17-26" Very pale brown (10YR 8/3) stony silt loam, pale brown (10YR 6/3) moist; moderate medium subangular, angular and cylindrical blocky structure; very hard; firm; nonsticky, nonplastic; common medium and fine roots; few medium and fine tubular pores; violent effervescence; secondary carbonates disseminated and coatings on stones; strongly alkaline (pH 9.0 TB); 65 percent of soil volume occupied by coarse fragments; abrupt discontinuous boundary.

C2sicam 26-32" Very pale brown (10YR 8/3) duripan, pale brown (10YR 6/3) moist; plant roots were observed between strongly cemented layers; thin lenses of opal on the top of cemented layers; duripan occurs between stones and has been disturbed in places by rodents; abrupt irregular boundary.

IIR 32" Basalt bedrock.

IDAHO 11-59

Precip: 12-14"
Elevation: 5400'
Slope: W 2%

TOTAL ANNUAL YIELDS 1959

Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp
Grasses		
Agropyron spicatum	259	36
Sitanion hystrix	93	13
Poa secunda	76	11
Elymus cinereus	11	1
Agropyron riparium	4	1
Forbs		
Lupinus spp.	78	11
Aster Scopulorum	19	3
Senecio integerrimus	12	2
Astragalus cibarius	11	1
Phlox longifolia	9	1
Allium acuminatum	8	1
Lomatium triternatum	3	T
Other Forbs 1/	8	1
Annuals		
Bromus tectorum	1	T
Other annuals 2/	4	1
Woody Plants		
Artemisia tridentata	111	15
Chrysothamnus viscidiflorus	14	2
Total Annual Yields	721	100
Total Estimated Litter 3/	1325	

1/ Other forbs were too dry to identify.

2/ Other annuals include Collinsia parviflora

3/ Total estimated litter includes humic mulch.

11/25/69 V.K.H.

TANNER EXTREMELY STONY SILT LOAM (TYPIC DURIXEROLL)

FIELD NO: Idaho 12-59

ELEVATION: 5400' NORMAL ANNUAL PRECIPITATION: 13" NORMAL ANNUAL TEMPERATURE: 43° F.

LOCATION: Twin Falls County, Idaho, 1¼ miles west of the Cedar Creek Reservoir on the Purshell Ranch. It is in the SW¼, Sec. 21, T14S, R13E (BPM), 42° 12' N, 114° 57' W.

LAND FORM: Gently sloping and undulating upland, Snake River Plain, 3 percent north-facing slope.

CLASSIFICATION: Tanner extremely stony silt loam, a member of the fine, montmorillonitic, frigid family of TYPIC DURIXEROLLS.

PARENT MATERIAL: Eolian and residuum, loess, rhyolite and basalt.

REMARKS: This soil is characterized by a slightly acid to neutral, mollic epipedon, a slightly acid to neutral, argillic horizon, and a duripan at a depth of 26 inches.

Roots of Idaho fescue, bearded bluebunch wheatgrass and low sagebrush penetrated to bedrock but were most abundant above the 20 inch depth. Low sagebrush roots branched profusely above the argillic horizon.

This study occupies a broad gently sloping drainage and could receive additional moisture from surrounding areas.

PEDON: Pedon is described under near potential vegetation. Color is for dry soil unless otherwise stated.

A11	0-2½"	(Under grass) Dark grayish brown (10YR 4/2) extremely stony silt loam, very dark brown (10YR 2/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many interstitial pores; neutral (pH 6.6 BTB); many angular basalt pebbles and stones; clear smooth boundary.
A12	2½-8"	Dark grayish brown (10YR 4/2) extremely stony silt loam, very dark brown (10YR 2/2) moist; weak thin platy structure; soft; friable; nonsticky, slightly plastic; many medium and fine roots; many medium and fine interstitial and tubular pores; many fine basalt pebbles and stones; slightly acid (pH 6.4 BTB); clear wavy boundary.
B1	8-13"	Brown (10YR 5/3) stony silty clay loam, dark brown (10YR 3/3) moist; weak medium prismatic breaking to moderate fine angular blocky structure; very hard; friable; slightly sticky, plastic; many medium and fine roots; common fine tubular pores; ped faces have thin coating of bleached sand and/or silt grains; many concretions of manganese; common basalt stones; slightly acid (pH 6.2 BTB); gradual wavy boundary.
B21t	13-20"	Brown (10YR 5/3) stony heavy silty clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic breaking to strong medium and fine angular blocky structure; extremely hard; very firm; sticky, very plastic; common medium and fine roots between peds; common fine and very fine tubular pores; thin patchy clay films; slightly acid (pH 6.2 BTB); many concretions of manganese; common basalt stones; upper 4 inches of prisms stained with organic matter; abrupt irregular boundary.
B22t	20-26"	Brown (10YR 5/3) stony clay, dark brown (10YR 3/3) moist; strong medium and coarse prismatic structure; extremely hard; very firm; very sticky, very plastic; common fine roots between peds; few fine tubular pores; neutral (pH 6.8 BTB); thin patchy clay films; many pressure faces; many concretions and flakes of manganese; common basalt pebbles; abrupt irregular boundary.
Csim	26-32"	Pale brown (10YR 6/3) moderately cemented duripan, dark brown (10YR 4/3) moist; duripan is weakly calcareous in places and carbonates occur in thin lenses; many basalt stones; abrupt irregular boundary.
IIR	32"	Basalt bedrock.

IDAHO 12-59

Precip: 10-12"
Elevation: 5400'
Slope: N 3%

TOTAL ANNUAL YIELDS 1959 - 1961

Repeat Studies Based on 20 Random Estimated Plots

Species	1959 Lbs. Acre	1959 % Comp	1960 Lbs. Acre	1960 % Comp	1961 Lbs. Acre	1961 % Comp
Grasses						
Agropyron spicatum	139	25	201	25	127	24
Poa secunda	79	14	160	20	52	10
Festuca idahoensis	33	6	76	9	52	10
Sitanion hystrix	34	6	31	4	20	4
Poa nevadensis	-	-	9	1	4	1
Danthonia unispicata	-	-	2	T	-	-
Forbs						
Lupinus polyphyllus	21	4	48	6	21	4
Phlox longifolia	18	3	17	2	14	3
Senecio integerrimus	6	1	13	2	12	2
Allium acuminatum	7	1	8	1	5	1
Viola beckwithii	4	1	10	1	6	1
Erigeron nevadincola	8	1	12	1	4	1
Other Forbs 1/	17	3	47	6	40	8
Annuals						
Bromus tectorum	5	1	6	1	5	1
Other Annuals 2/	11	2	6	1	5	1
Woody Plants						
Artemisia arbuscula	180	32	162	20	149	29
Chrysothamnus viscidiflorus	-	-	4	T	3	T
Total Annual Yields	562	100	812	100	519	100
Total Estimated Litter 3/	1072		1950		883	

1/ Other forbs include Agoseris glauca, Aster scorpulorum, Astragalus agrestis, Astragalus cibarius, Astragalus convallarius, Castilleja longispica, Eriogonum caespitosum, Lomatium nudicaule, Lomatium triternatum, Mertensia oblongifolia, Microseris nutans and Zigadenus paniculatus.

2/ Other annuals include Collinsia parviflora and Gayophytum racemosum.

3/ Total estimated litter for 1959 and 1960 includes humic mulch.