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HERBAGE DYNAMICS ON THE PAWNEE SITE: ABOVEGROUND AND BELOWGROUND HERBAGE DYNAMICS ON THE FOUR GRAZING INTENSITY TREATMENTS; AND PRELIMINARY SAMPLING ON THE ECOSYSTEM STRESS SITE

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ABSTRACT

Sampling on the grazing intensity treatments was much the same as in 1969. The methods for sampling aboveground and belowground herbage are included in Section I. Section II and Section III are figures and tables for the aboveground and belowground herbage dynamics, respectively. The descriptions of raw and "first pass" data for these figures are in Appendix A and B, respectively.

Preliminary sampling design for the ecosystem stress study site is in Section IV.

SECTION I: SAMPLING METHODS FOR ABOVEGROUND AND BELOWGROUND HERBAGE ON THE GRAZING INTENSITY TREATMENTS

ABOVEGROUND HERBAGE

Adjacent to each of the eight microwatersheds, macroplots with similar soil and vegetative characteristics were selected for sampling, varying in size from 0.25 to 0.5 ha depending on the available area. Non-destructive sampling (estimation) was carried on within the area to determine total aboveground biomass.

The eight study areas adjacent to the microwatersheds were sampled once each in the pre-growing and post-growing seasons and biweekly during the season of rapid vegetative growth and flowering.

Forty permanent microplots were selected within the study area. Each plot was marked with two 1/4-inch in diameter by six-inch plastic stakes. Each of the plots was located 20.871 ft apart in a grid design. Each area was sampled using the visual estimation of green weight by species within a 50 cm × 50 cm quadrat (.25 m^2). Correction factors for estimating were obtained by estimating and clipping by species every sixth quadrat. Litter was included as a single species in the estimation technique. Each of the clipped quadrats were randomly selected by using a table of random numbers and selecting from the 40 numbered permanent plots. The clipped plots were taken to the right or left of the permanent plots a set number of paces to prevent clipping the same area. Selection of plots to be clipped were predetermined for each sampling date. After the sixth plot had been estimated and clipped by species in the field, wet weights were determined for the material sorted in the field. All estimated wet and dry weights were taken in grams. This procedure was repeated until all 40 plots had been estimated and eight plots estimated and clipped for each study area. One person did

all the estimating, and the estimator did not check himself once the sampling had begun.

All samples were dried at 50°C in a forced air oven for 48 hours to obtain oven dry weights. Samples of the major species from each of the eight clipped plots on each area were composited. Minor species were usually combined by grazing treatments, and if an inadequate sample was obtained, the minor species were composited for all treatments on a sampling date. All plant materials were ground through a wiley mill with a 1 mm sieve.

Litter samples were collected by raking the material by hand from the ground. Litter samples were combined for each study area and ground through a wiley mill with a 1 mm sieve. This material was ashed to determine the amount of organic material. All litter values were then corrected to an ash-free basis. Five microscope slides were made of the litter material from each study area on each sampling date. Twenty microscopic fields were read per slide. The plant composition of plant species was determined and converted to kilograms per hectare.

Two of the clipped quadrats were selected at random on each of the study areas to determine the amount of standing live and dead blue grama on each sampling date. The samples were taken to the laboratory for hand separation. After separation, each category was oven-dried for 48 hours at 50°C, then weighed and ground. Chemical analyses will be run for each category and for all major species of plants. These analyses will include nitrogen, phosphorous, and gross energy.

Two methods of obtaining correction factors for the estimated weights are being analyzed. The following criteria are being used in obtaining the correction factors:

(i) For species of plants occurring in more than five of the clipped plots, correction factors are calculated by grazing treatments.

(ii) For species of plants occurring in less than five of the clipped plots on a grazing treatment, the correction factors are obtained from those plots on which it is present for all treatments on a sampling date.

(iii) Correction factors for species of plants not present on five clipped quadrats for all treatments on a sampling date are based on the number of times they occur throughout the sampling season.

(iv) All correction factors and estimates are corrected for green weights first and then converted to a dry weight basis.

(v) After a correction factor is calculated, it is applied to each of the estimated weights for that species.

One method for calculating correction factors (CF) for each species of plants is by the following formula:

$$\frac{\sum_{1}^{K} A}{\sum_{1}^{K} E} = CF$$

Where A is the actual weight summed over K number of plots, and E is the estimated weight summed over K number of plots.

The second method of calculating a correction factor is determined from the following formula:

$$\frac{\sum_{1}^{K}\left[\frac{\sum_{1}^{N} A}{\sum_{1}^{N} E}\right]}{K} = CF$$

The actual weight (A) is divided by the estimated weight (E) for an individual plot and summed over all plots (K). The whole quantity is divided by K number of plots to obtain an average.

BELOWGROUND HERBAGE

Total root biomass was obtained by collecting soil cores using a hand corer or pneumatic corer at approximately two week intervals during the growing season of 1970. Root samples were collected on eight 0.25 m^2 plots, located randomly within the macroplots which were clipped to determine herbage biomass. The eight clipped plots per macroplot were utilized to obtain all samples for total root biomass. Thus, the actual aboveground production was known for the sampled area.

Root biomass was sampled using a 7.5 cm diameter core to a depth of 10 cm. On two sampling periods, samples were taken to a depth of 80 cm to obtain a more accurate estimate of root biomass distribution. On these two sampling periods, 5.0 cm diameter cores were taken. These cores were divided into five sections as outlined in Fig. 1. These sections were then washed to extract the roots. Root washing was done by the day after the sampling was completed so that washing could be completed while the cores were still near field moisture levels. Special dispersing agents were not necessary under

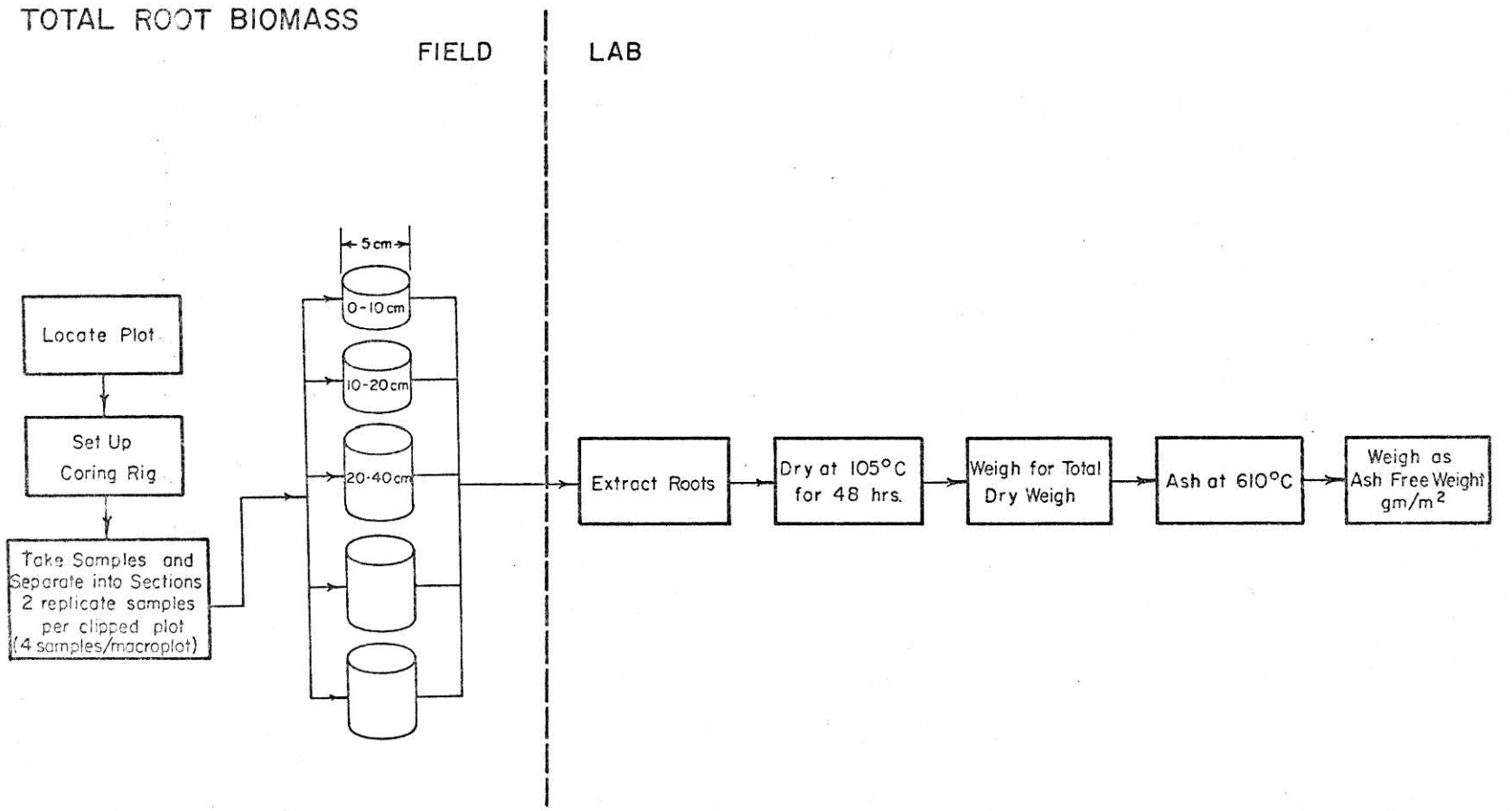

Fig. 1. Flow diagram of field and laboratory sampling procedures.

these conditions. However, when the samples were left for a period of time, they were then soaked in a solution of sodium pyrophosphate to aid in dispersing the soil. Even after careful washing, a certain amount of soil remained on the roots. The roots were oven-dried at 105°C for 48 hours, weighed, and then ashed at 610°C for eight hours. Root biomass was expressed as an ash-free value to correct for adhering soil particles and was converted to kilograms per hectare.

SECTION II: SUMMARY FIGURES AND TABLES OF ABOVEGROUND HERBAGE DYNAMICS, 1970

Table 1. Total standing crop (kg/ha) with confidence interval (CI)[a/] and frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	1.000	1143	125	1.000	894	97	1.000	786	85	1.000	743	137
May 5	1.000	998	105	1.000	1003	93	1.000	743	89	1.000	851	95
May 19	1.000	1058	125	1.000	1061	114	1.000	899	144	1.000	944	161
June 1	1.000	999	93	1.000	975	86	1.000	731	84	1.000	695	97
June 16	1.000	1309	110	1.000	1381	143	1.000	718	93	1.000	1023	120
June 29	1.000	1156	115	1.000	1299	123	1.000	827	89	1.000	860	139
July 15	1.000	1305	127	1.000	1532	80	1.000	1047	148	1.000	1052	173
July 29	1.000	1287	107	1.000	1377	108	1.000	1105	118	1.000	910	134
Aug. 11	.938	1175	118	1.000	1555	137	1.000	1027	120	1.000	1000	177
Aug. 24	1.000	1260	101	1.000	1610	157	1.000	1024	104	1.000	1059	211
Sept. 8	1.000	1086	99	1.000	1512	158	1.000	921	118	1.000	1005	182

[a/] $CI = \bar{x} \pm SE(t.05)$.

[b/] Freq. = frequency of occurrence of the total standing crop on the clipped plots. This is not meaningful for this table but is included for consistency since frequency may have meaning for the other plant categories.

Table 2. Standing crop of grasses (kg/ha) with confidence interval (CI)[a/] and frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 sampling dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	1.000	818	105	1.000	485	46	1.000	662	65	.990	355	22
May 5	1.000	602	51	1.000	626	41	1.000	548	44	1.000	396	16
May 19	1.000	641	81	1.000	569	45	1.000	687	100	1.000	467	13
June 1	1.000	623	70	1.000	599	45	1.000	555	41	1.000	436	12
June 16	1.000	929	86	1.000	754	69	1.000	576	71	1.000	664	17
June 29	1.000	789	92	1.000	679	52	1.000	621	48	1.000	475	33
July 15	1.000	855	101	1.000	780	55	1.000	705	58	1.000	588	18
July 29	1.000	873	78	1.000	730	39	1.000	810	72	1.000	547	22
Aug. 11	.938	752	84	1.000	807	69	1.000	764	76	1.000	535	23
Aug. 24	1.000	837	49	1.000	775	64	1.000	850	56	1.000	522	18
Sept. 8	1.000	687	44	1.000	738	55	1.000	657	51	1.000	517	18

[a/] $CI = \bar{x} \pm SE(t.05)$.

[b/] Freq. = frequency of occurrence of grasses in clipped quadrats. This is not meaningful for this table but is included for consistency since frequency may have meaning for the other plant categories.

Table 3. Standing crop of forbs (kg/ha) with confidence interval (CI)[a/] and frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	.677	250	78	.677	303	84	.458	114	53	.573	388	129
May 5	.792	353	97	.854	276	80	.635	163	70	.792	455	154
May 19	.875	386	104	.917	389	107	.719	206	103	.875	456	156
June 1	.927	334	76	.990	274	71	.844	166	67	.948	259	95
June 16	.969	328	78	.969	292	75	.844	115	46	.927	359	114
June 29	.938	312	75	.969	403	85	.865	186	69	.958	385	126
July 15	.896	384	88	.990	501	107	.760	310	130	.854	464	170
July 29	.906	349	82	.969	415	83	.854	276	88	.938	363	124
Aug. 11	.792	362	84	.969	485	92	.750	231	81	.885	466	165
Aug. 24	.917	324	90	.969	477	117	.865	149	65	.833	537	205
Sept. 8	.854	334	89	.948	510	126	.792	233	98	.760	487	175

[a/] $CI = \bar{x} \pm SE(t.05)$.

[b/] Freq. = frequency of occurrence of forbs in clipped quadrats.

Table 4. Total standing crop of shrubs (kg/ha) with confidence intervals (CI)[a/] frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 sampling dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	.198	75	44	.344	106	34	.052	11	10	-	-	-
May 5	.156	44	29	.375	100	37	.083	32	35	-	-	-
May 19	.146	31	18	.344	104	35	.063	6	3	.010	22	36
June 1	.146	42	24	.375	102	35	.052	10	9	-	-	-
June 16	.135	52	30	.396	335	119	.083	26	20	-	-	-
June 29	.167	55	27	.292	217	86	.063	20	20	-	-	-
July 15	.146	66	33	.344	250	77	.083	32	23	.010	-	-
July 29	.156	64	34	.365	232	82	.052	19	19	.010	-	-
Aug. 11	.146	61	34	.344	263	84	.083	33	28	.010	-	1
Aug. 24	.188	99	43	.396	358	110	.052	25	30	-	-	-
Sept. 8	.188	65	31	.281	264	93	.042	32	32	-	-	-

[a/] CI = $\bar{x} \pm SE(t.05)$.

[b/] Freq. = frequency of occurrence of shrubs in dipped quadrats.

Table 5. Standing crop (kg/ha) of blue grama with confidence intervals (CI)[a/] and frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	1.000	623	82	.990	276	21	1.000	428	25	.990	344	22
May 5	1.000	476	45	1.000	407	27	1.000	385	15	1.000	376	16
May 19	1.000	480	82	1.000	350	19	.990	358	13	1.000	424	14
June 1	.990	458	69	.990	357	20	1.000	361	14	.990	380	13
June 16	1.000	739	91	1.000	438	35	1.000	323	26	1.000	570	21
June 29	1.000	567	93	.990	380	22	1.000	404	13	.990	386	20
July 15	.990	667	102	.990	464	25	1.000	397	18	1.000	513	19
July 29	1.000	656	79	.990	474	23	1.000	462	19	1.000	471	21
Aug. 11	.938	534	81	1.000	459	24	1.000	445	17	1.000	459	19
Aug. 24	1.000	619	48	.990	450	28	1.000	596	25	1.000	470	19
Sept. 8	1.000	496	44	1.000	418	18	.990	421	17	1.000	446	17

[a/] $CI = \bar{x} \pm SE(t.05)$.

[b/] Freq. = frequency of occurrence of shrubs in clipped quadrats.

Table 6. Standing crop of plains prickly pear (kg/ha) with confidence intervals (CI)[a/] and frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 sampling dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	.344	233	77	.365	291	84	.208	106	52	.323	382	129
May 5	.323	328	94	.365	248	81	.208	155	69	.365	436	154
May 19	.365	348	103	.344	348	107	.167	192	102	.344	426	157
June 1	.417	279	73	.302	226	70	.198	138	64	.313	227	95
June 16	.417	252	78	.344	204	74	.146	90	46	.344	310	114
June 29	.292	205	66	.344	264	82	.167	147	68	.365	347	125
July 15	.333	279	88	.323	350	106	.188	259	128	.313	421	169
July 29	.375	256	82	.354	273	82	.198	200	85	.323	316	123
Aug. 11	.302	254	84	.354	312	89	.188	180	79	.265	416	165
Aug. 24	.344	270	89	.281	320	114	.135	111	59	.354	495	205
Sept. 8	.354	282	90	.333	395	127	.167	199	98	.354	451	175

[a/] $CI = \bar{x} \pm SE(t.05)$.

[b/] Freq. = frequency of occurrence of shrubs in dipped quadrats.

Table 7. Standing crop (kg/ha) of sun sedge with confidence intervals (CI)[a/] and frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	.510	16	4	.510	6	1	.635	18	4	.333	4	1
May 5	.719	17	3	.583	20	4	.719	25	5	.563	10	2
May 19	.667	29	7	.646	22	4	.667	26	5	.563	20	4
June 1	.750	29	6	.677	18	4	.677	23	4	.656	14	3
June 16	.656	39	9	.552	31	7	.729	38	7	.708	23	4
June 29	.656	44	8	.552	25	6	.688	48	8	.698	23	8
July 15	.573	52	12	.490	34	9	.688	62	12	.510	26	5
July 29	.604	49	10	.500	29	7	.594	66	16	.490	23	8
Aug. 11	.521	36	14	.438	24	6	.625	27	5	.500	28	14
Aug. 24	.563	40	13	.479	23	5	.615	29	7	.385	13	4
Sept. 8	.604	36	10	.510	23	5	.615	24	4	.500	23	10

[a/] $CI = \bar{x} \pm SE(t.05)$.

[b/] Freq. - Frequency of occurrence of shrubs in dipped quadrats.

Table 8. Standing crop of litter (kg/ha) with confidence interval (CI)[a/] and frequency of occurrence (Freq.)[b/] on four grazing intensities at 11 dates during 1970.

Sampling Date	No Grazing			Light Grazing			Moderate Grazing			Heavy Grazing		
	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI	Freq.	kg/ha	CI
April 9	.990	872	88	.990	1308	134	.979	565	58	.948	872	207
May 5	.958	1039	165	.948	953	112	.969	531	80	.990	1044	270
May 19	.969	1361	326	1.000	1481	230	1.000	659	173	.979	1292	332
June 1	.969	1243	240	.979	1794	338	.979	959	339	.990	1277	318
June 16	.990	1193	207	.979	1194	227	.990	548	130	1.000	1371	341
June 29	.969	716	120	1.000	1559	294	.979	554	102	.990	802	249
July 15	.979	1425	322	1.000	1564	326	1.000	945	347	.990	1733	533
July 29	.979	1025	224	.979	1933	397	.990	840	259	.990	1422	376
Aug. 11	.927	942	223	1.000	1168	218	.990	601	162	.990	1505	474
Aug. 24	1.000	1344	321	1.000	984	233	1.000	674	61	1.000	1362	424
Sept. 8	.990	676	79	.958	778	66	.990	595	105	.938	1112	362

[a/] CI = $\bar{x} \pm SE(t.05)$.

[b/] Freq. = frequency of occurrence of shrubs in dipped quadrats.

Table 9. Standing live blue grama (kg/ha) on four grazing intensities at 11 dates during 1970.

Sampling Date	Grazing Intensity							
	No Grazing		Light Grazing		Moderate Grazing		Heavy Grazing	
April 9	0	623	0	276	0	428	0	344
May 5	25	451	37	370	34	351	42	334
May 19	141	339	100	250	139	219	130	294
June 1	212	246	163	194	157	204	213	167
June 16	400	339	225	213	200	123	386	184
June 29	254	313	187	193	247	157	225	161
July 15	462	205	284	180	261	136	363	150
July 29	402	254	307	167	230	232	334	157
Aug. 11	341	193	254	205	215	230	279	180
Aug. 24	292	327	210	240	275	321	256	214
Sept. 8	200	296	199	219	213	208	206	240

SD X

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215
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168
198
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241

Table 10. Percent standing live and dead blue grama on four grazing intensities at 10 sampling dates during 1970.

Sampling Date	Grazing Treatments	Standing Live		Standing Dead		
		$\bar{x}$% SL	SD	$\bar{x}$% SD	SD	
						Differences Between 9 April and 5 May
May 5	None	5.03	4.00	94.97	4.00	5.03
	Light	9.08	1.29	90.92	1.29	9.08
	Moderate	8.89	2.79	91.11	2.79	8.89
	Heavy	11.13	2.015	88.87	2.015	11.13
						Differences Between 5 May and 19 May
May 19	None	29.31	3.55	70.69	3.55	24.28
	Light	28.62	4.38	71.38	4.38	19.54
	Moderate	38.75	7.92	61.25	7.92	29.86
	Heavy	30.78	3.80	69.22	3.80	19.65
						Differences Between 19 May and 1 June
June 1	None	46.17	8.16	53.83	8.16	16.86
	Light	45.47	4.73	54.53	4.73	16.85
	Moderate	43.42	6.50	56.58	6.50	4.67
	Heavy	56.02	3.39	43.98	3.39	25.24
						Differences Between 1 June and 16 June
June 16	None	54.11	2.39	45.89	2.39	7.94
	Light	51.37	3.82	48.63	3.82	5.90
	Moderate	61.97	1.77	38.03	1.77	18.55
	Heavy	67.78	3.69	32.22	3.69	11.76
						Differences Between 16 June and 1 July
July 1	None	55.37	4.54	44.63	4.54	1.26
	Light	49.09	5.57	50.91	5.57	-2.28
	Moderate	61.27	2.91	38.73	2.91	-.70
	Heavy	58.41	7.19	41.59	7.19	-9.37

Table 10. (Continued)

Sampling Date	Grazing Treatments	Standing Live $\bar{x}$% SL	Standing Live SD	Standing Dead $\bar{x}$% SD	Standing Dead SD	
						Differences Between 1 July and 15 July
July 15	None	69.30	10.62	30.70	10.62	13.93
	Light	61.14	5.04	38.86	5.04	12.05
	Moderate	65.70	2.92	34.30	2.92	4.43
	Heavy	70.25	5.62	29.75	5.62	11.84
						Differences Between 15 July and 29 July
July 29	None	61.30	6.15	38.70	6.15	-8.00
	Light	64.83	10.25	35.17	10.25	3.69
	Moderate	49.80	7.96	50.20	7.96	-15.90
	Heavy	70.91	4.44	29.09	4,44	.66
						Differences Between 29 July and 11 Aug.
Aug. 11	None	63.91	7.84	36.09	7.84	2.61
	Light	55.42	5.63	44.58	5.63	-9.41
	Moderate	48.24	3.24	51.76	3.24	-1.56
	Heavy	60.72	3.51	39.28	3.51	-10.19
						Differences Between 11 Aug. and 24 Aug.
Aug. 24	None	47.24	5.29	52.76	5.29	-16.67
	Light	46.75	5.56	53.25	5.56	-8.67
	Moderate	46.21	4.68	53.79	4.68	-2.03
	Heavy	54.35	7.14	45.65	7.14	-6.37
						Differences Between 24 Aug. and 8 Sept.
Sept. 8	None	40.42	7.08	59.58	7.08	-6.82
	Light	47.68	3.97	52.32	3.97	.93
	Moderate	50.62	7.91	49.38	7.91	4.41
	Heavy	46.29	6.81	53.71	6.81	-8.06

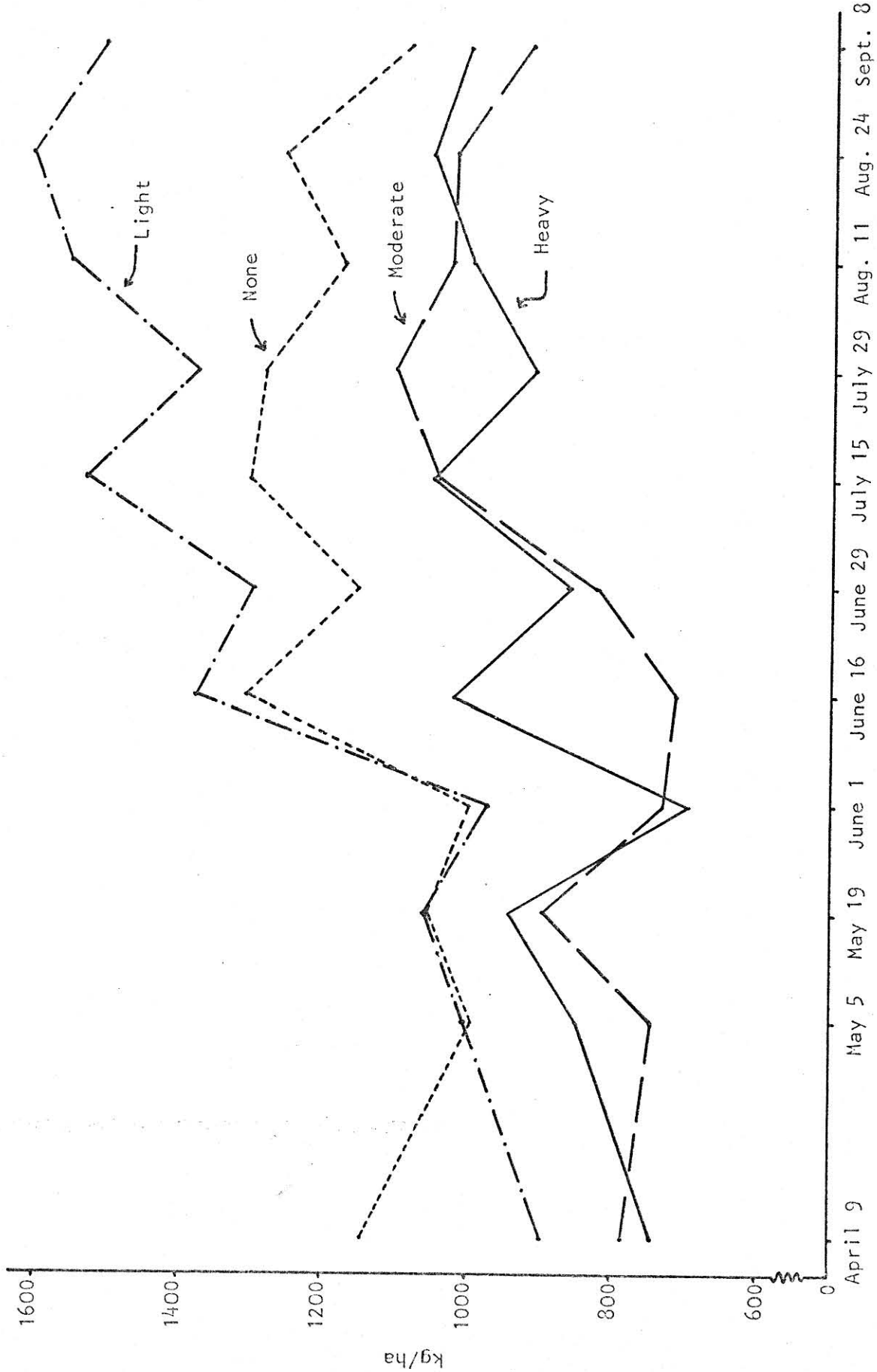
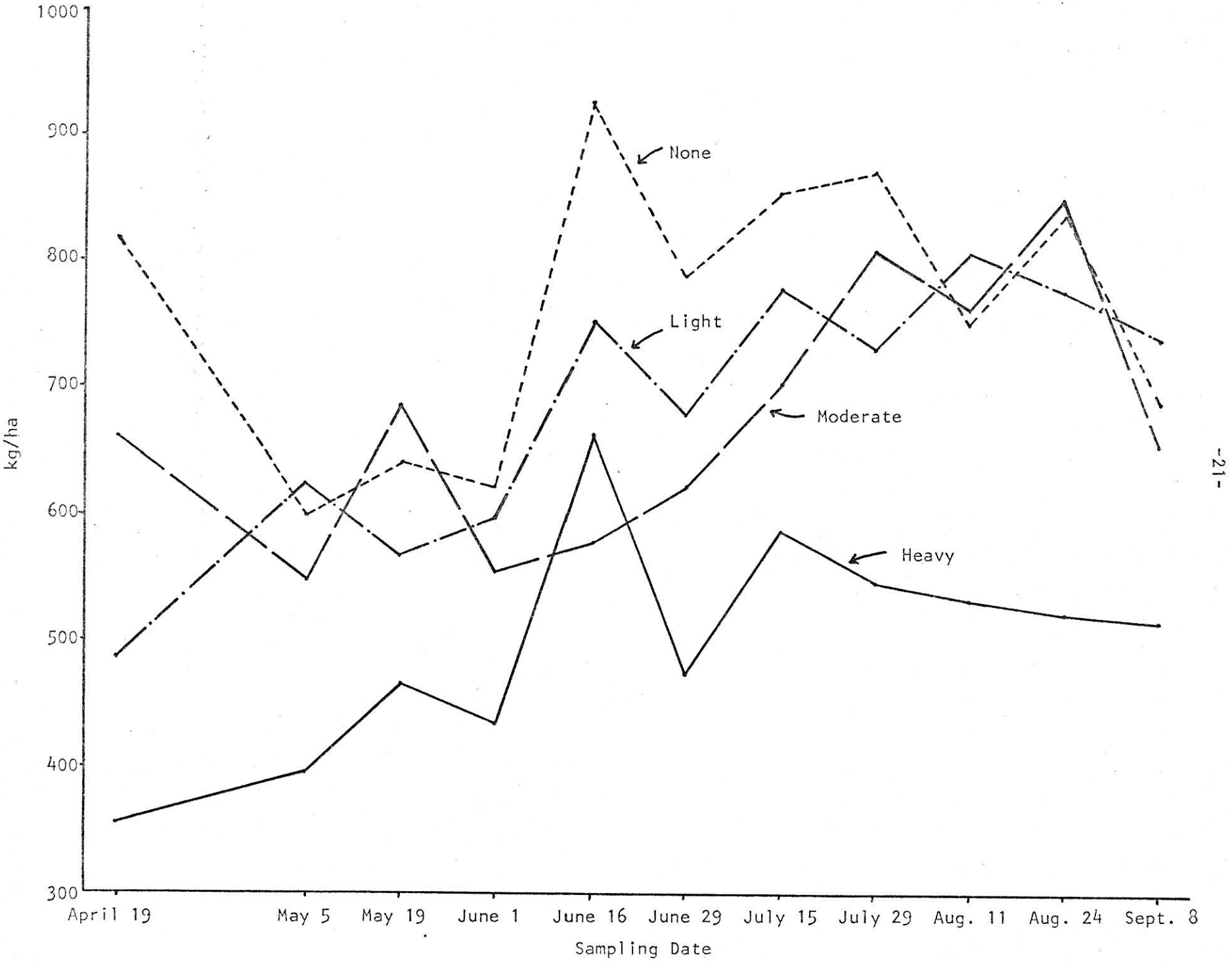


Fig. 2. Total standing crop on four grazing intensities, 1970.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500
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kg/ha
None
Light
Moderate
Heavy
April 19
May 5
May 19
June 1
June 16
June 29
July 15
July 29
Aug. 11
Aug. 24
Sept. 8
Sampling Date

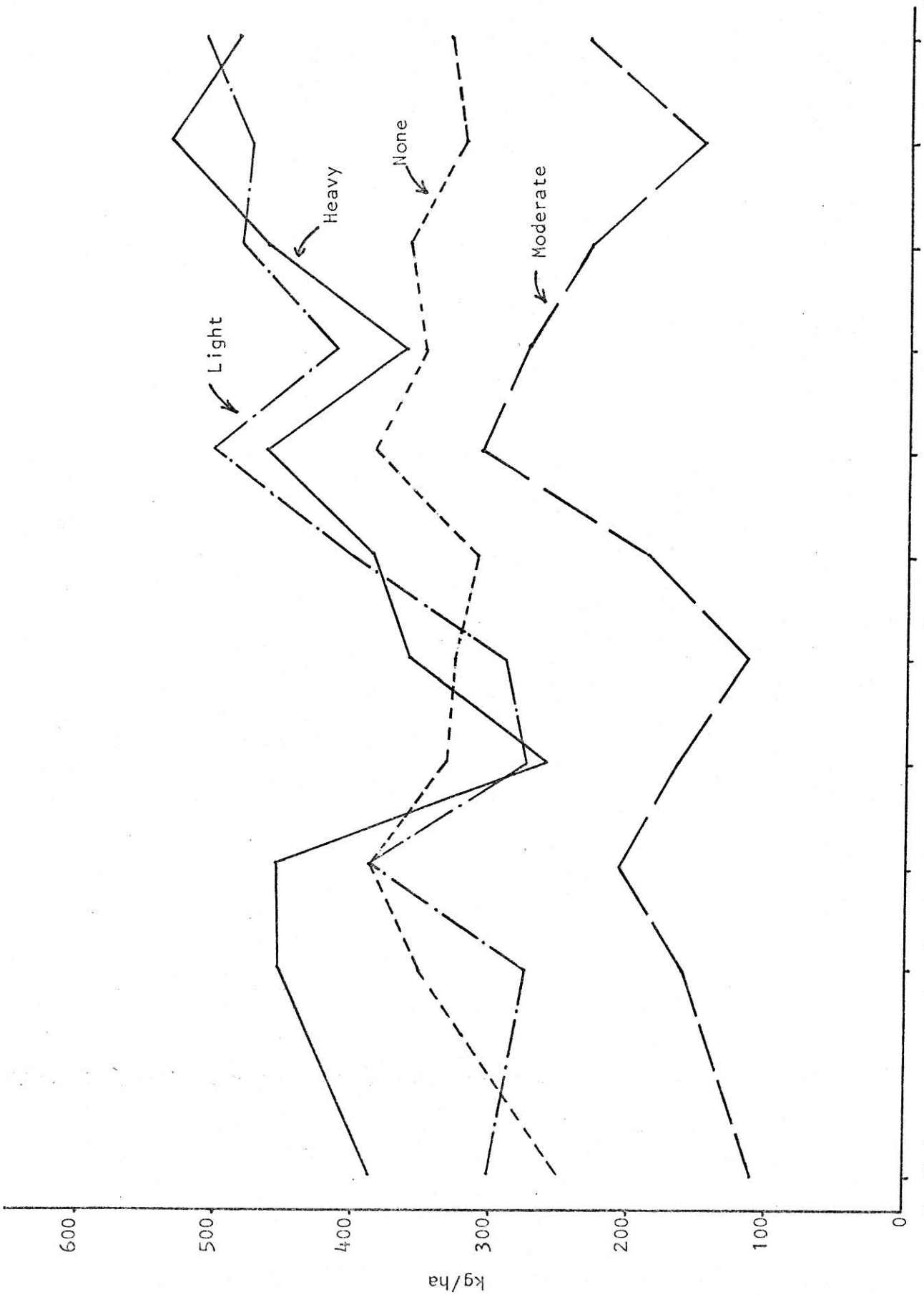
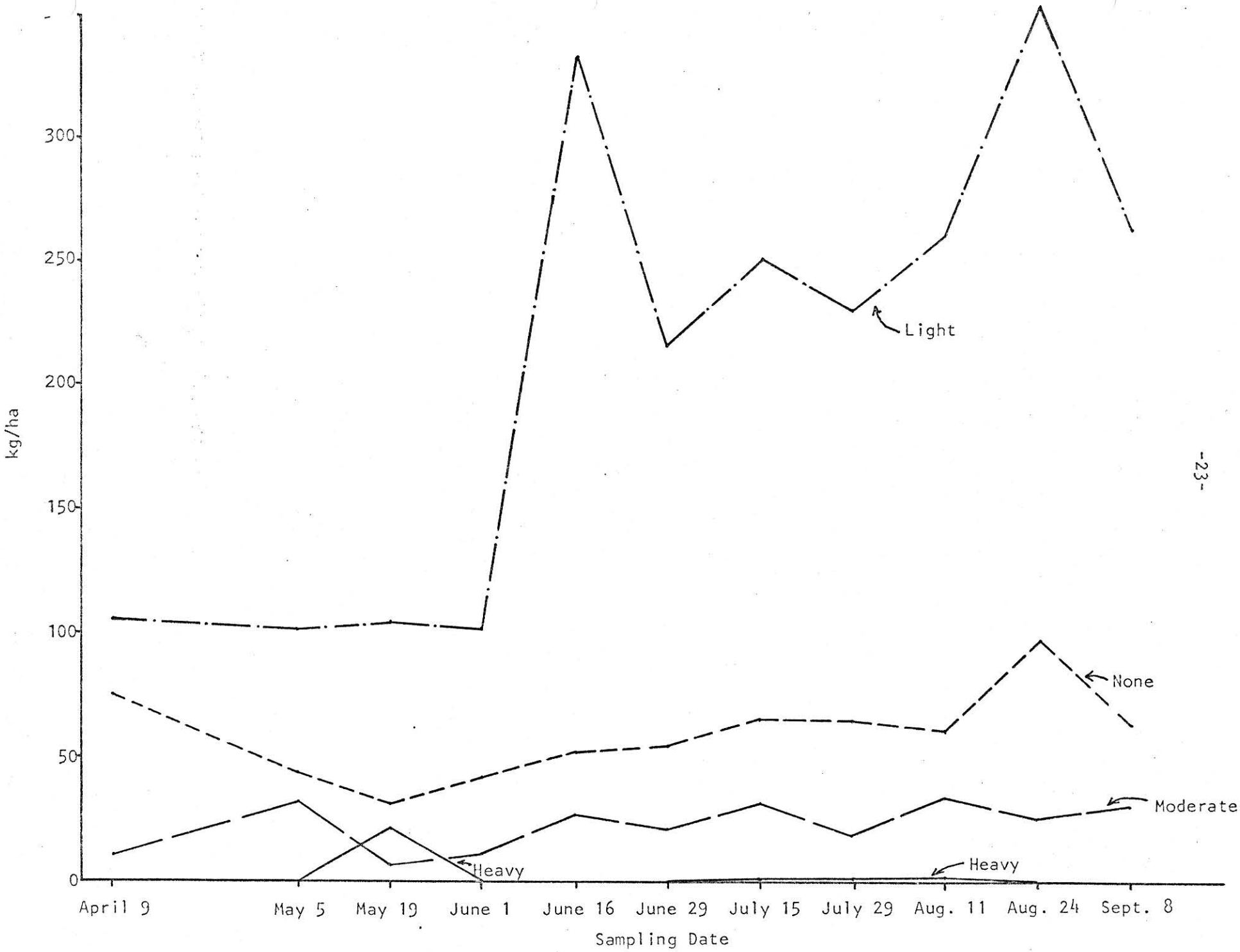


Fig. 4. Standing crop of forbs on four grazing intensities, 1970.


300
250
200
150
100
50
0
kg/ha
Light
None
Moderate
Heavy
Heavy
April 9
May 5
May 19
June 1
June 16
June 29
July 15
July 29
Aug. 11
Aug. 24
Sept. 8
Sampling Date

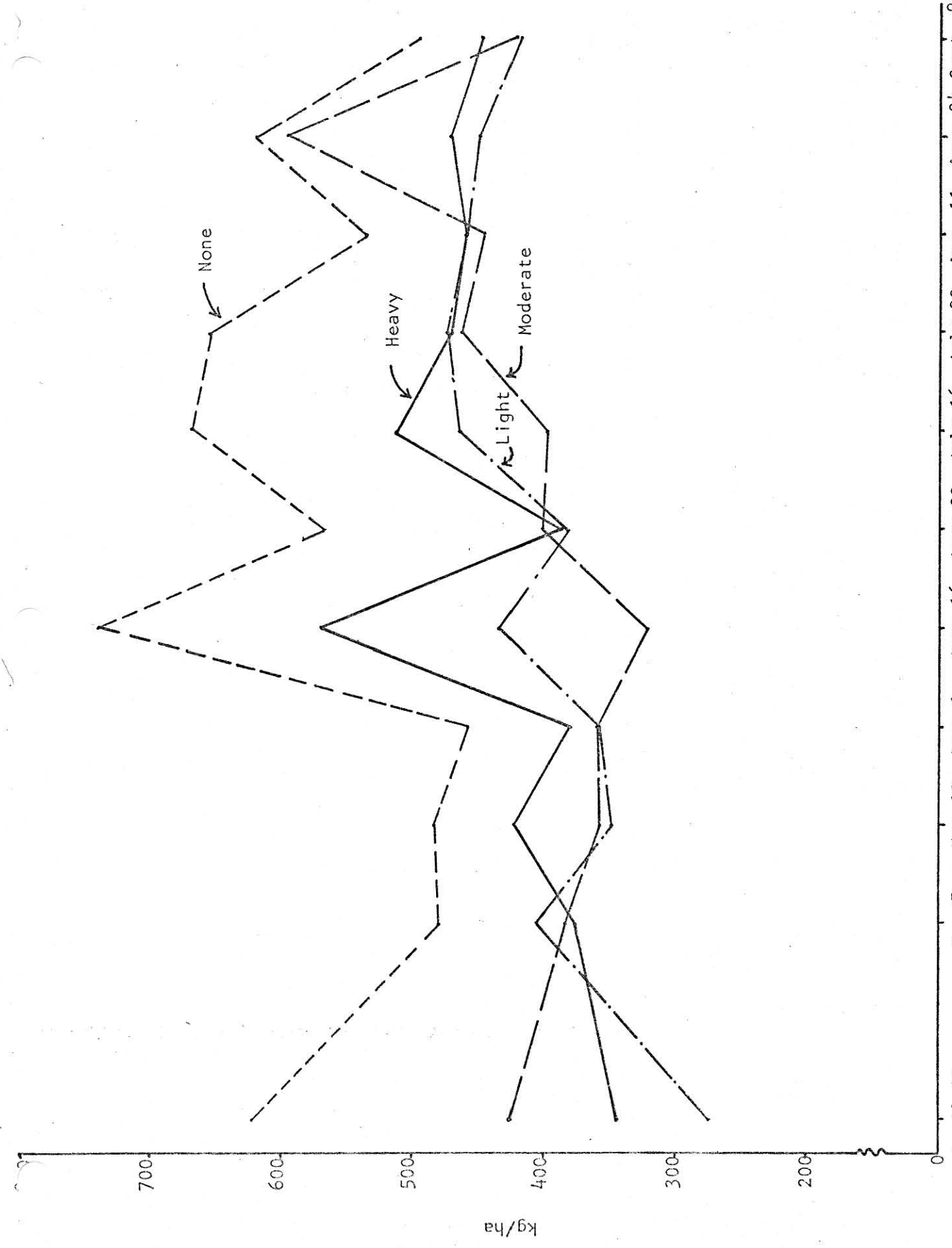


Fig. 6. Standing crop of blue grama on four grazing intensities, 1970.

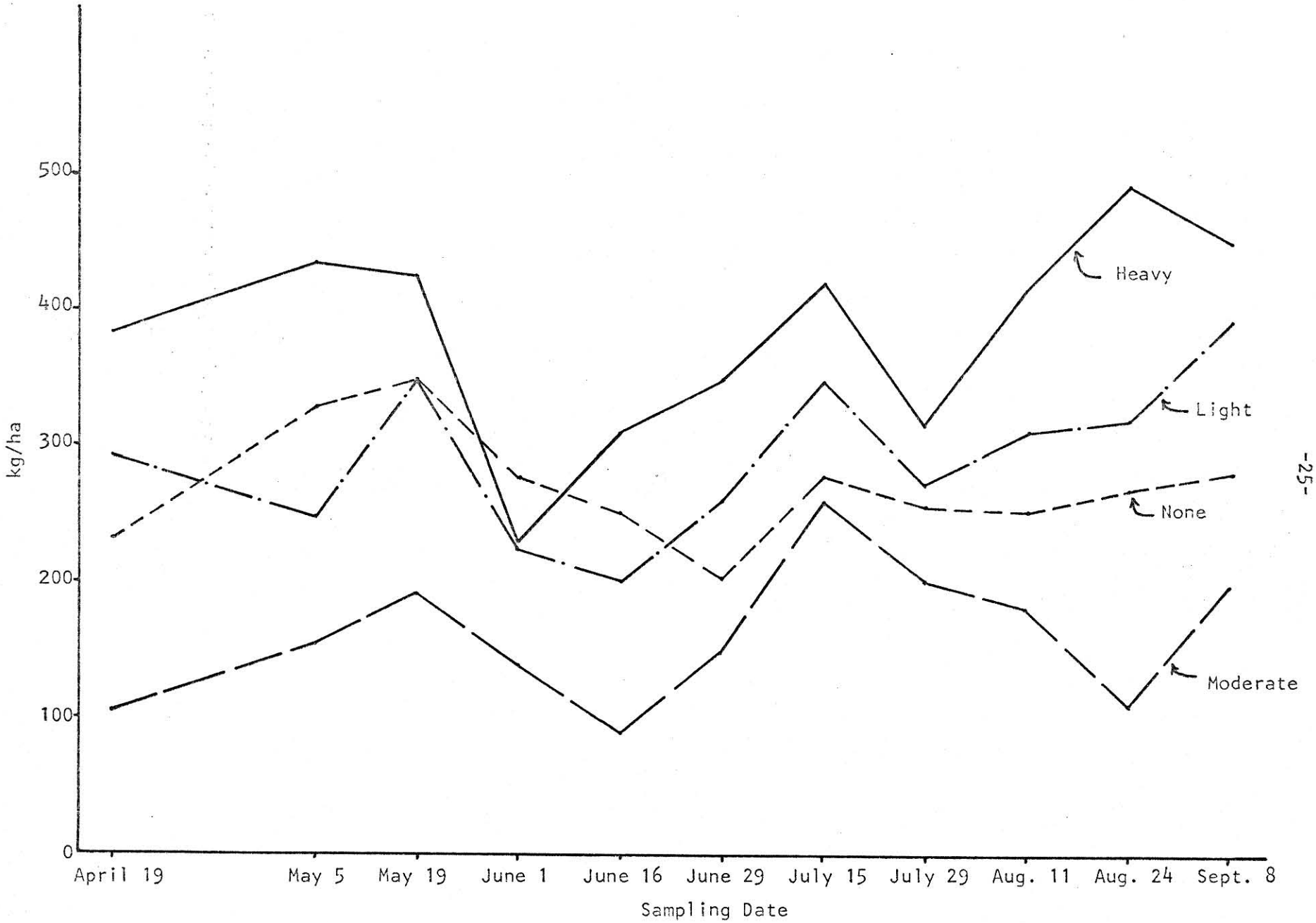
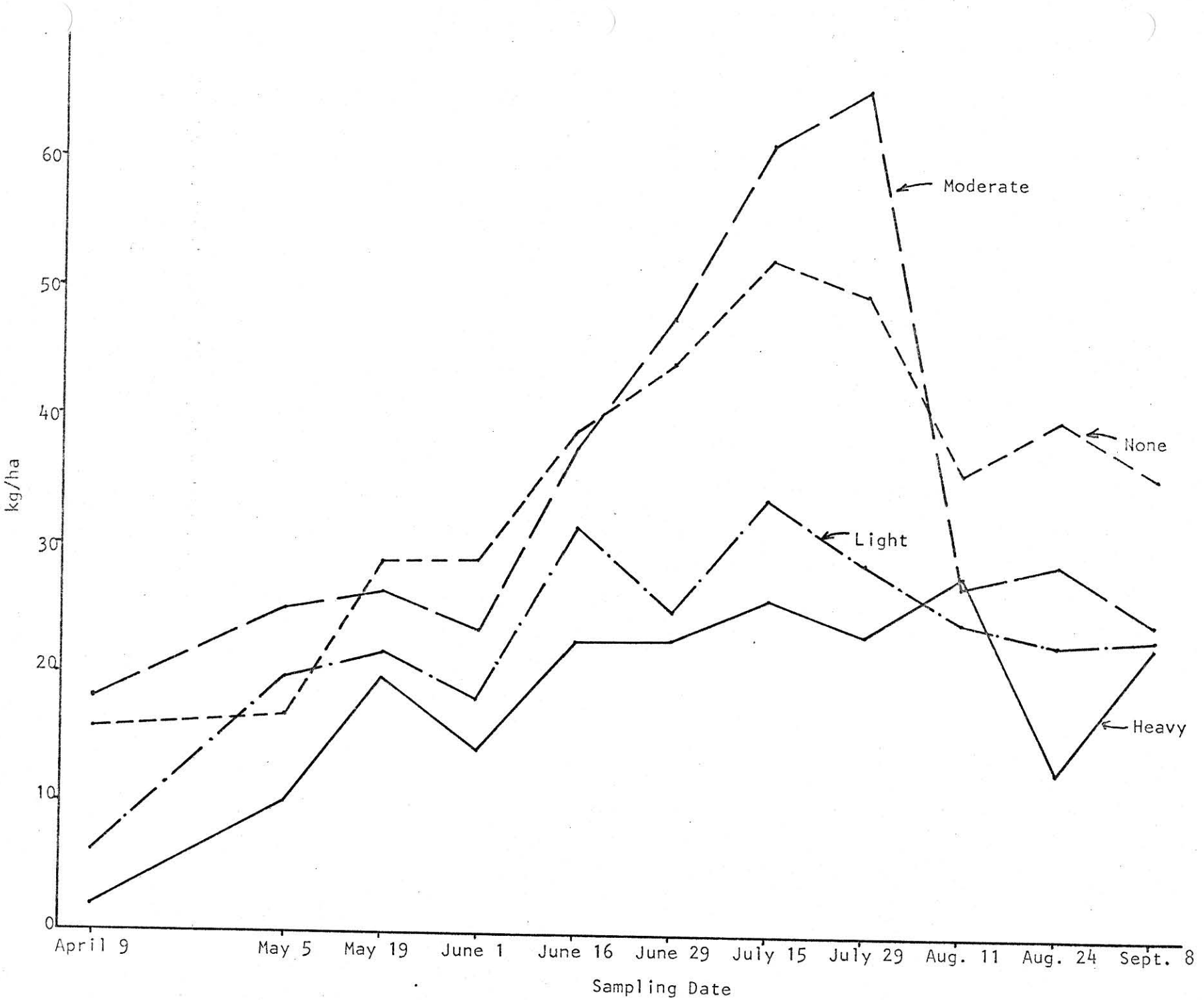


Fig. 7. Standing crop of plains prickly pear on four grazing intensities, 1970.


60
50
40
30
20
10
0
kg/ha
Moderate
None
Light
Heavy
April 9
May 5
May 19
June 1
June 16
June 29
July 15
July 29
Aug. 11
Aug. 24
Sept. 8
Sampling Date

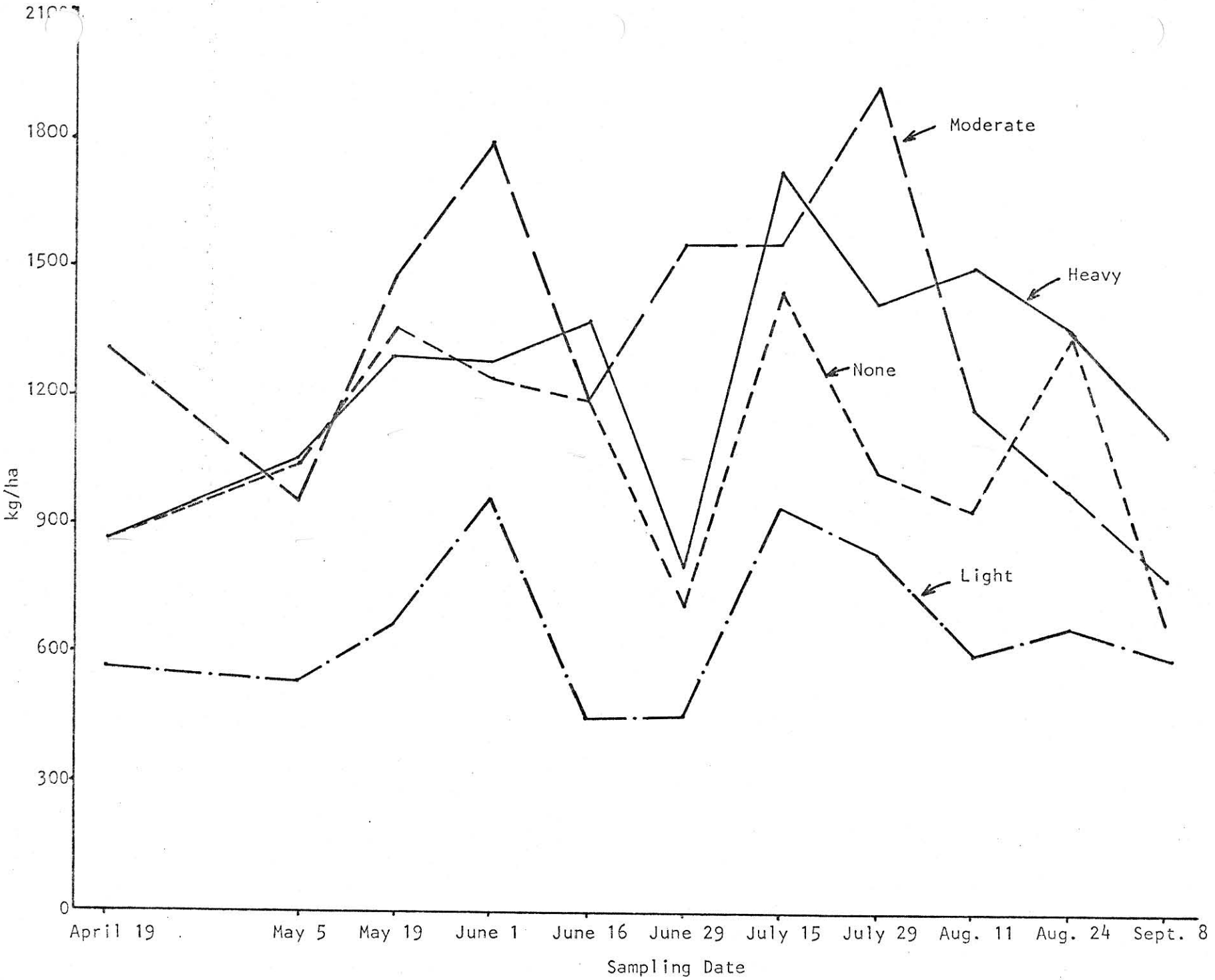


Fig. 9. Standing crop of litter on four grazing intensities, 1970.

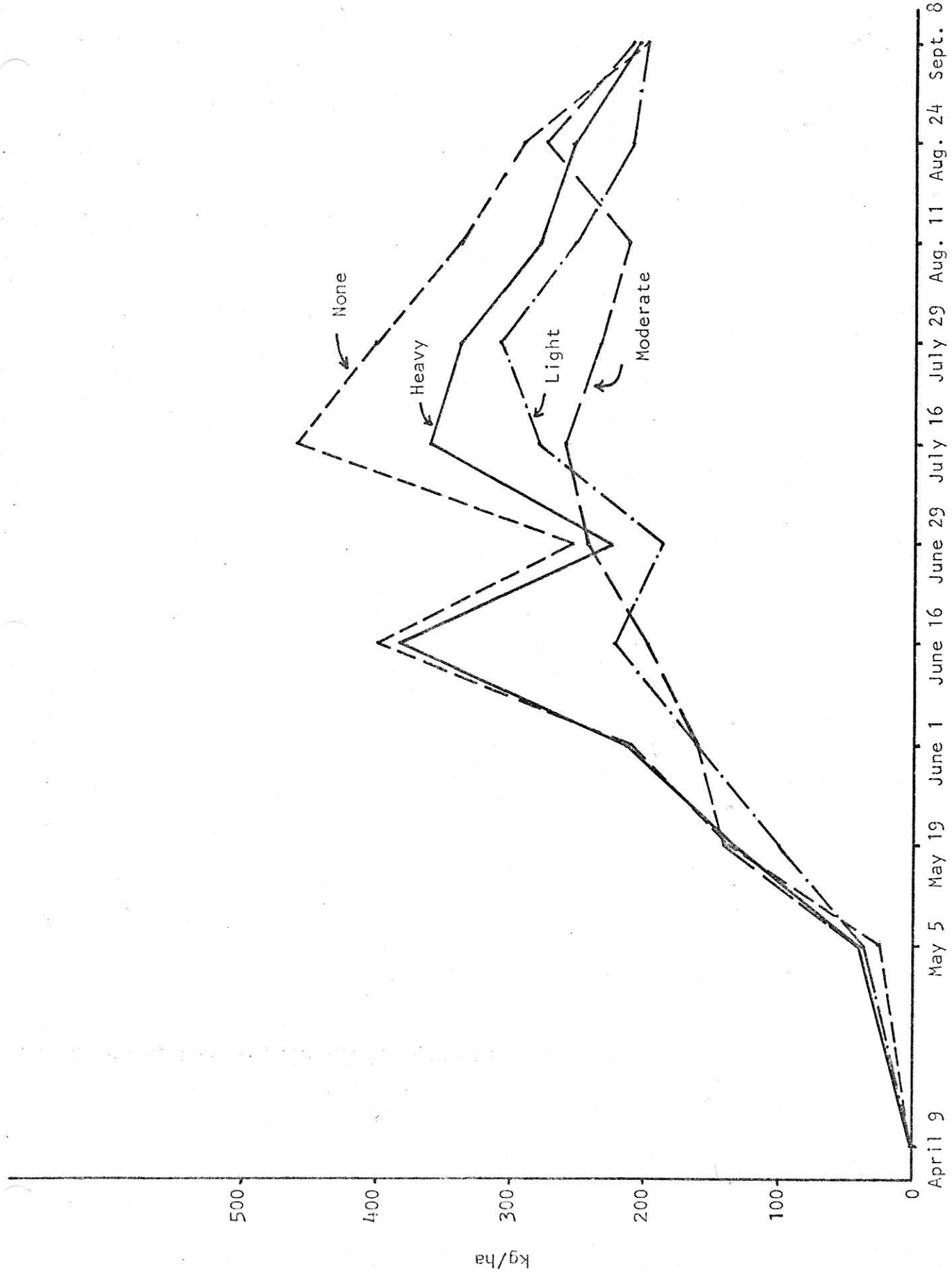


Fig. 10. Standing crop of live blue grama on four grazing intensities, 1970.

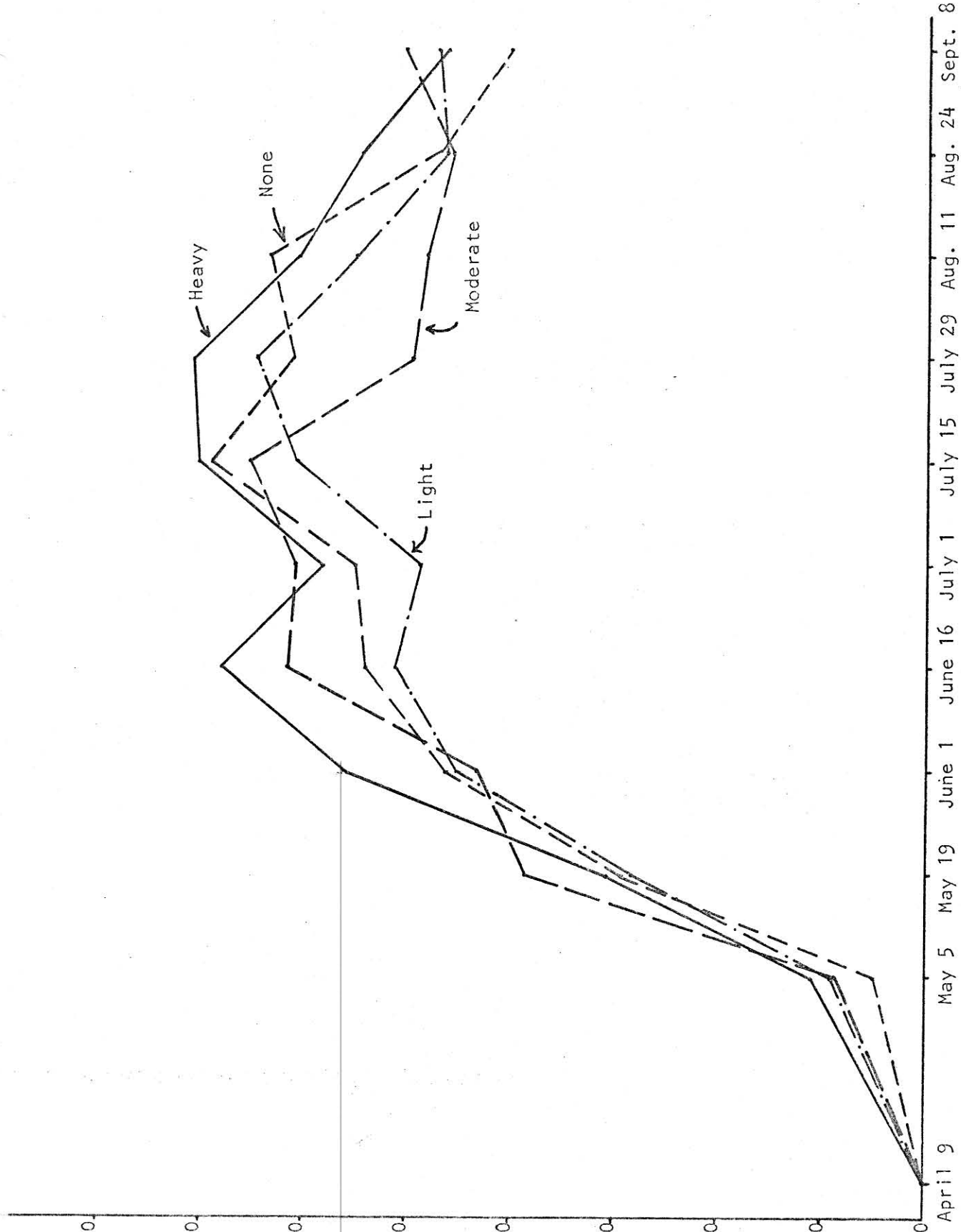


Fig. 11. Percent standing live of blue grama on four grazing intensities, 1970.

SECTION III: SUMMARY TABLES FOR BELOWGROUND HERBAGE, 1970

Table 11. Summary of root material from the 0-10 cm section by treatments for the growing season 1970 (kg/ha).

Grazing Treatment and Watershed	April 24	May 8	May 22	June 4	June 19	July 17	July 29	Aug. 12	Sept. 12
No Grazing									
WS 2									
Mean	8454	10289	7824	8171	10754	12060	11511	11042	9140
SE	735	862	880	563	1026	1337	833	672	720
WS 8									
Mean	10408	11315	11693	10705	13282	13490	11744	11903	9753
SE	939	679	782	889	735	686	1590	863	942
Avg. Mean	9431	10802	9758	9438	12018	12775	11628	11472	9446
Light Grazing									
WS 4									
Mean	9800	9128	7637	9216	11354	10747	8947	10614	10615
SE	498	917	681	1130	1176	940	844	680	654
WS 5									
Mean	9554	10015	9735	9594	8054	12674	11496	10965	8989
SE	604	1182	1032	788	878	487	893	1234	425
Avg. Mean	9677	9572	8536	9405	9684	11710	10222	10790	9802
Moderate Grazing									
WS 6									
Mean	9490	8960	9466	9215	9655	12937	11523	9217	10293
SE	932	1207	1087	947	1233	1855	1496	798	1310
WS 7									
Mean	11399	11304	8870	8791	13962	13144	11477	9438	11774
SE	664	1131	1208	832	363	683	1195	1159	1117
Avg. Mean	10444	10132	9168	9001	11808	13040	11500	9328	11034

Table 11. (Continued)

Grazing Treatment and Watershed	April 24	May 8	May 22	June 4	June 19	July 17	July 29	Aug. 12	Sept. 12
Heavy Grazing									
WS 1									
Mean	10377	11873	8385	8858	13476	11546	12419	12117	11081
SE	888	902	1093	700	1795	801	1405	630	987
WS 3									
Mean	8385	9710	9295	8509	10341	9793	10334	9185	11583
SE	979	977	1282	1014	1386	848	680	916	1582
Avg. Mean	9381	10792	8840	8684	11908	10670	11376	10651	11332

Table 12. Summary of root material for all depths by treatments for the November 8, 1969 sampling period (kg/ha).

Grazing Treatment and Watershed	0-10 cm	10-20 cm	20-40 cm	40-60 cm	60-80 cm	Total
No Grazing						
WS 2						
Mean	7094	1699	1873	1040	987	12694
SE	749	169	176	73	233	566
WS 8						
Mean	9493	1865	2115	829	613	14914
SE	793	230	192	35	82	521
Avg. Mean	8294	1782	1994	934	800	13804
Light Grazing						
WS 4						
Mean	6626	1779	2088	1206	689	12388
SE	391	206	344	397	159	1388
WS 5						
Mean	7259	1258	1192	674	466	10850
SE	864	170	225	66	44	467
Avg. Mean	6942	1518	1640	940	578	11619
Moderate Grazing						
WS 6						
Mean	7699	1471	1582	1080	347	12178
SE	1247	58	219	98	32	1378
WS 7						
Mean	6623	1517	1555	909	479	11083
SE	889	130	320	222	93	1441
Avg. Mean	7161	1494	1568	994	413	11630
Heavy Grazing						
WS 1						
Mean	7524	1850	1344	924	504	11546
SE	1524	108	213	174	156	1977
WS 3						
Mean	9628	1665	1815	867	500	14474
SE	1737	148	316	89	70	1462
Avg. Mean	8576	1458	1580	896	502	13010

Table 13. Summary of root material for all depths by treatments for the December 18, 1969 sampling period (kg/ha).

Grazing Treatment and Watershed	0-10 cm	10-20 cm	20-40 cm	40-60 cm	60-80 cm	Total
No Grazing						
WS 2						
Mean	6126	1023	1230	736	400	9516
SE	604	155	193	109	33	982
WS 8						
Mean	6929	1350	1172	721	394	10566
SE	1659	70	213	46	22	1862
Avg. Mean	6528	1186	1201	728	397	10041
Light Grazing						
WS 4						
Mean	5548	1322	1305	798	529	9502
SE	753	90	159	104	113	1098
WS 5						
Mean	6482	1479	1517	644	467	10589
SE	825	123	274	52	84	1224
Avg. Mean	6015	1400	1411	721	498	10046
Moderate Grazing						
WS 6						
Mean	4770	1660	1465	664	358	8918
SE	621	230	221	98	24	806
WS 7						
Mean	7516	1705	1766	857	586	12430
SE	1534	87	68	115	71	1482
Avg. Mean	6143	1682	1616	760	472	10674
Heavy Grazing						
WS 1						
Mean	4689	1136	1114	660	446	8045
SE	1006	192	259	69	90	1357
WS 3						
Mean	6878	1684	1828	922	422	11734
SE	516	248	71	116	97	775
Avg. Mean	5784	1410	1471	791	434	9890

Table 14. Summary of root material for all depths by treatments for the July 2, 1970 sampling period (kg/ha).

Grazing Treatment and Watershed	0-10 cm	10-20 cm	20-40 cm	40-60 cm	60-80 cm	Total
No Grazing						
WS 2						
Mean	8561	1608	1660	1446	5117	18392
SE	1180	267	279	502	4487	4577
WS 8						
Mean	5929	2839	2749	1703	1077	14296
SE	822	1070	383	245	175	1273
Avg. Mean	7245	2224	2204	1574	3097	16344
Light Grazing						
WS 4						
Mean	8032	1554	3064	1067	706	14423
SE	1150	150	1060	198	99	1980
WS 5						
Mean	7808	1663	3189	707	545	13912
SE	882	187	1297	138	81	1769
Avg. Mean	7920	1608	3126	887	626	14168
Moderate Grazing						
WS 6						
Mean	15277	1973	2667	1386	844	22147
SE	3451	191	386	120	114	3881
WS 7						
Mean	10833	1908	2084	1458	1177	17459
SE	1767	240	194	135	211	2204
Avg. Mean	13055	1940	2376	1422	1010	19803
Heavy Grazing						
WS 1						
Mean	9089	2378	1989	1122	845	15422
SE	1936	625	257	142	123	2696
WS 3						
Mean	9711	2543	5077	1847	924	20104
SE	1358	376	2622	286	89	3572
Avg. Mean	9400	2460	3533	1484	884	17763

Table 15. Summary of root material for all depths by treatments for the August 26, 1970 sampling period (kg/ha).

Grazing Treatment and Watershed	0-10 cm	10-20 cm	20-40 cm	40-60 cm	60-80 cm	Total
No Grazing						
WS 2						
Mean	7906	1697	1534	1429	1009	13574
SE	1581	206	242	228	111	2039
WS 8						
Mean	9171	1645	2525	1343	1478	16162
SE	1799	181	308	241	392	2130
Avg. Mean	8538	1671	2030	1386	1244	14868
Light Grazing						
WS 4						
Mean	8476	1524	2306	1727	1381	15415
SE	680	190	555	249	227	986
WS 5						
Mean	9216	1702	1907	1697	1180	15702
SE	1121	141	187	285	186	1266
Avg. Mean	8846	1613	2106	1712	1280	15558
Moderate Grazing						
WS 6						
Mean	8420	1801	1663	1008	787	13679
SE	1381	162	362	166	137	373
WS 7						
Mean	12040	1583	2425	1274	861	18182
SE	1773	114	186	172	123	1938
Avg. Mean	10230	1692	2044	1141	824	15930
Heavy Grazing						
WS 1						
Mean	9695	1384	1976	1412	988	15456
SE	1265	100	188	195	136	1365
WS 3						
Mean	8040	1248	2144	1399	953	13785
SE	1111	134	421	179	140	1694
Avg. Mean	8868	1316	2060	1406	970	14620

Table 16. Summary of crown material (kg/ha) by treatment for the 1969 growing season.

Grazing Treatment and Watershed	May 24	June 21	July 2	July 16	July 31	Aug. 13	Aug. 27	Sept. 10
No Grazing								
WS 2								
Mean	1936	2433	2524	2241	2162	1885	2325	2247
SE	571	529	1001	198	558	275	1339	364
WS 8								
Mean	2526	3284	2877	---	3792	3446	2221	2200
SE	917	604	872	---	1076	631	630	169
Avg. Mean	2231	2858	2700	2241	2977	2666	2273	2224
Light Grazing								
WS 4								
Mean	2452	1743	2819	1851	2482	1701	2550	2710
SE	171	827	972	556	868	231	375	885
WS 5								
Mean	1794	1357	2538	1316	1881	3273	1992	3143
SE	972	266	631	258	379	932	332	424
Avg. Mean	2123	1550	2678	1584	2182	2487	2271	2926
Moderate Grazing								
WS 6								
Mean	1532	2513	3366	2243	1700	2878	1743	2438
SE	489	179	230	810	373	897	376	1063
WS 7								
Mean	2171	1707	2504	2072	3982	1988	2532	2517
SE	536	275	635	206	1396	623	384	847
Avg. Mean	1852	2110	2935	2158	2841	2433	2138	2478
Heavy Grazing								
WS 1								
Mean	1792	2236	1862	2336	2684	2120	2257	1866
SE	705	106	290	363	545	175	490	355
WS 3								
Mean	2052	2458	787	1880	1411	2251	3654	2925
SE	489	678	292	229	336	736	1379	545
Avg. Mean	1922	2347	1324	2108	2048	2186	2956	2396

2032 2216 2409 2023 2514 2493 2409 2506

SECTION IV: PRELIMINARY SAMPLING SCHEME AND DATA FOR THE ECOSYSTEM STRESS SITE, 1970

INTRODUCTION

This report reviews progress to date of the ecosystem stress project on the Pawnee Site. Instrumentation and treatments are discussed as well as preliminary data that was collected during the 1970 growing season.

The major objective of the project is to investigate responses of both the structure and functioning of the shortgrass ecosystem as it is subjected to the stresses of irrigation and nitrogen fertilization.

SITE AND TREATMENT DESCRIPTION

The systems stress study area on the Pawnee Site consists of an area of approximately 15 ha located on a sandy loam soil in the Ascalon series. The area was fenced in the fall of 1969 to exclude large herbivores. Previous to fencing, the area had been grazed by cattle and probably by antelope and deer.

The study area (Fig. 12) is rectangular with the long axis oriented east and west. The topography is uniformly level except for the northwest corner of Plot 1 which slopes to the north.

Ten 1-ha plots are located within the exclosure. Six of these have irrigation equipment on them. The present study will utilize primarily 8 of the 10 plots. The other two (1 and 6) will be reserved to use later in the event that another treatment is found to be necessary for the present study, or they will be used to conduct a separate treatment regime. The eight primary plots were divided into two replicates, and four treatments were randomly located within each replicate. The treatments are as follows: (i) control; (ii) irrigation; (iii) nitrogen fertilization; (iv) irrigation and nitrogen fertilization.

Replications . . . . . I and II

Treatment #1 . . . . . Control
#2 . . . . . Irrigation
#3 . . . . . Fertilization
#4 . . . . . E and I

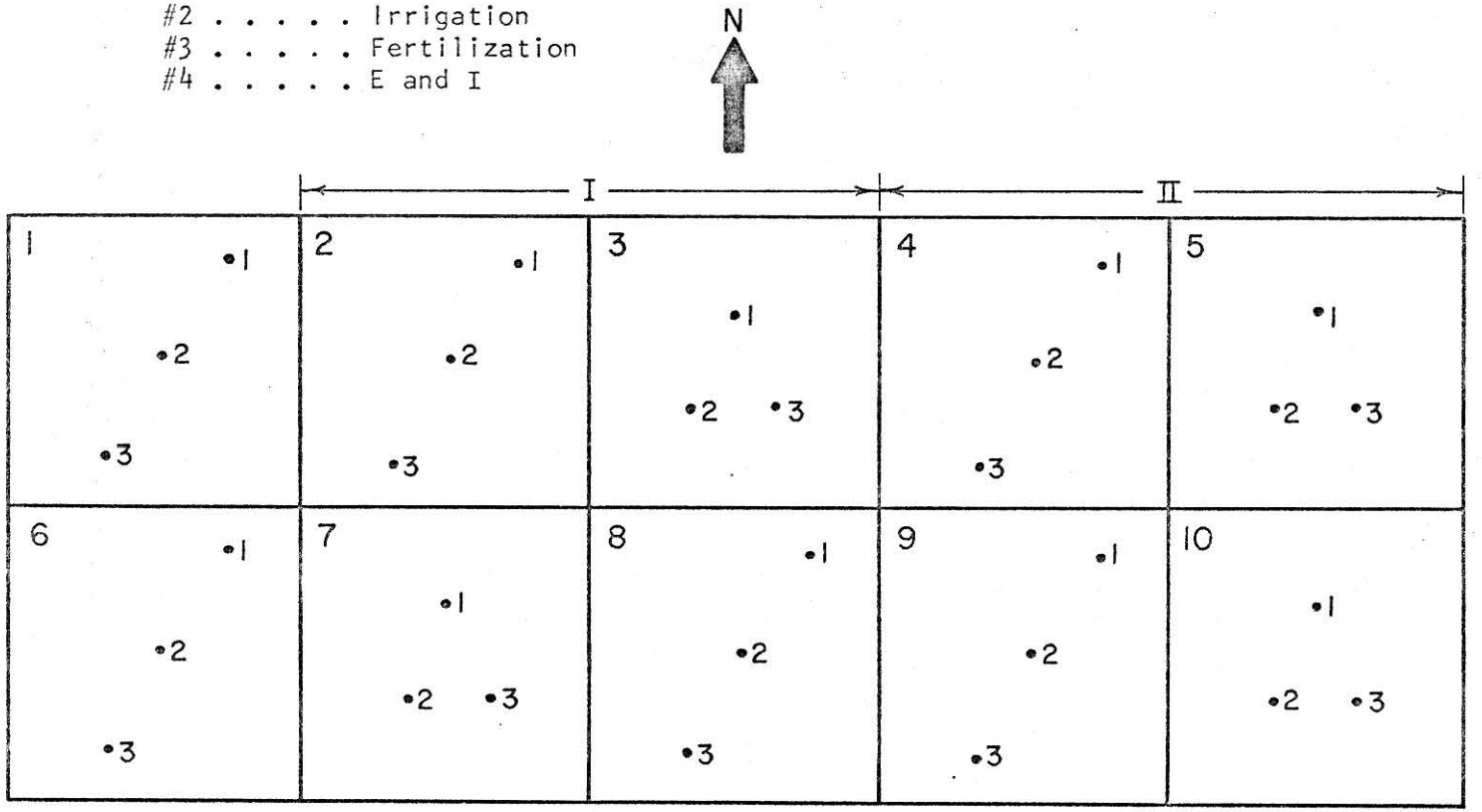


Fig. 12. System stress study area, plot and replicate location, and neutron access tube location.

The objective of irrigation treatment is to increase the amount of water available to the plants at any time that the soil temperature at 10 cm is above 5°C. The amount of this increase in available water and the criteria that will be used to decide the frequency of application will be discussed in the research objectives section of this report. The irrigation system was operational for only part of the 1970 growing season, so no actual irrigation treatment was applied.

The nitrogen fertilization treatment was begun in 1970 with an application of 450 kg/ha of ammonium nitrate (150 kg/ha of actual N) on June 1. This treatment will be repeated annually in the spring.

The irrigation and nitrogen fertilization treatment will receive the same irrigation treatment as the irrigated only and the same fertilization treatment as the fertilizer only.

EQUIPMENT AND INSTRUMENTATION

Irrigation water will be applied by an individually controllable solid-set sprinkler irrigation system on each plot to be irrigated (Fig. 13). The water is derived from a 300-ft deep well. The well is 21 inches in diameter with a 16-inch perforated casing. The water is pumped by a 25-hp turbine pump, and there is approximately 75 ft difference in elevation between the well and the irrigation site.

The main line from the pump to the individual plots is 5-inch aluminum pipe. From the main line to the lateral lines that the sprinklers are on is 4- and 3-inch aluminum pipe. The lateral lines are 2-inch pipe. The sprinklers have 7/64-inch nozzles, with a minimum diameter of throw of 84 ft and a discharge of 2.5 gallons per minute at 52.5 pounds per square inch nozzle pressure.

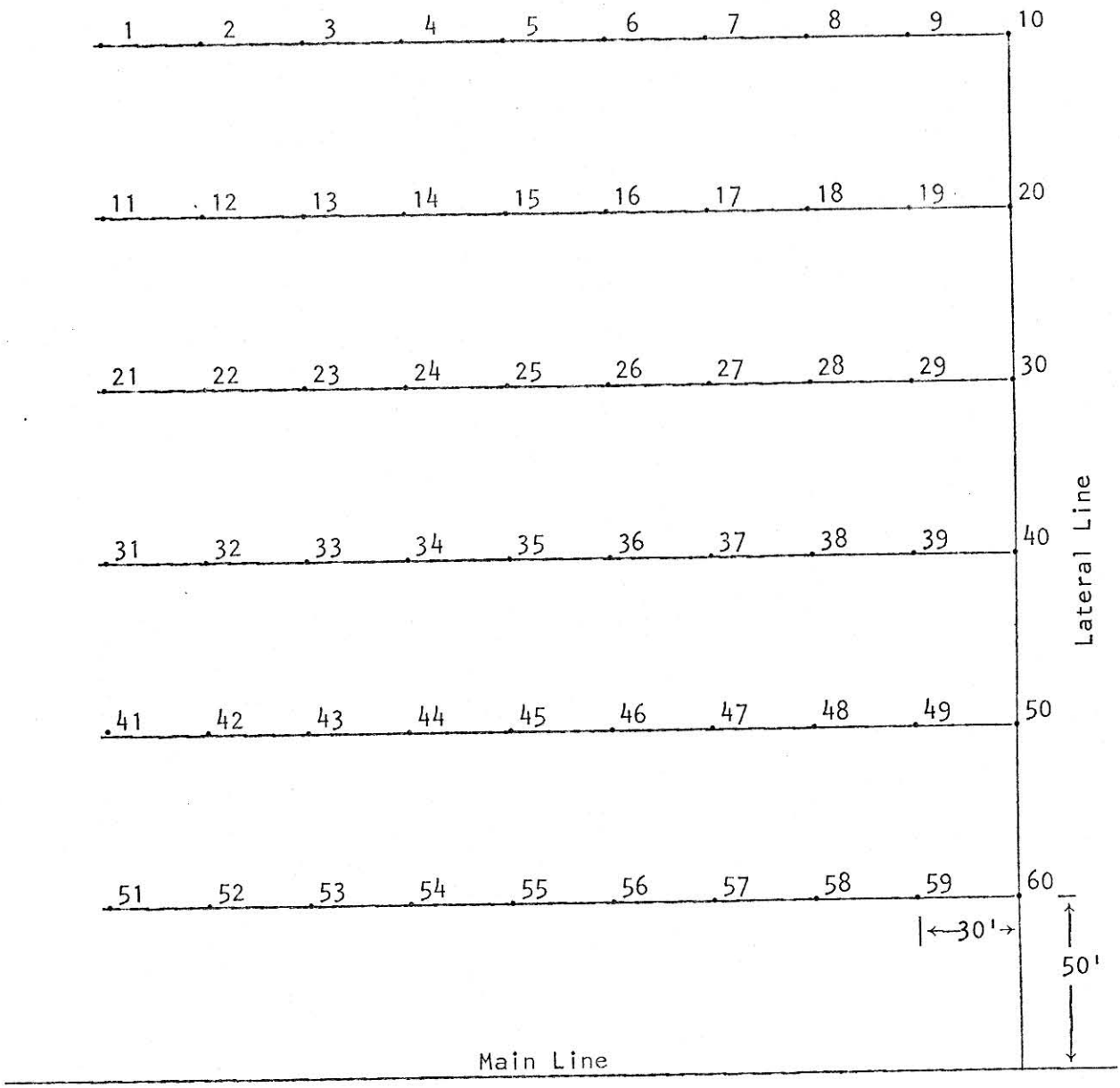


Fig. 13. General diagram of a plot with the irrigation system in place and nozzle numbers used for determining uniformity coefficients.

The lateral lines are spaced 50 ft apart with the nozzles 30 ft apart. The system was designed to have a uniformity coefficient of 80%.

Due to several limiting factors, the plots must be irrigated individually. Plot to be irrigated, starting and stopping time, and duration is regulated by a central automatic controller that can be programmed with an irrigation schedule. The controller can be used in conjunction with tensiometers to begin irrigation when soil water potential reaches a predetermined critical value.

Each plot has three neutron probe access tubes. Locations of the access tubes are shown in Fig. 12. The irrigated plots each have three raingages to measure the amount of water applied by irrigation.

Uniformity Coefficient

As stated previously, the irrigation system was designed to have a uniformity coefficient of 80%. After the system was constructed, the uniformity coefficient was tested. This was done by measuring the amount of water caught in containers positioned at constant intervals within the irrigated area. Three plots were tested using a 30 × 50 ft area with a nozzle at each corner. The plots and nozzle numbers tested (Fig. 14) were as follows: Plot 4, nozzles 25, 26, 27, 28; Plot 8, nozzles 43, 44, 53, 54; Plot 9, nozzles 7, 8, 17, 18. The containers were placed 2.5 ft from the lateral lines and 5 ft from each other. The amount of water caught by each container was measured to the nearest 0.01 ml.

The uniformity coefficient (Cu) was calculated using the formula:

$$Cu = 100 \left(1.0 - \frac{\Sigma X}{mn}\right)$$

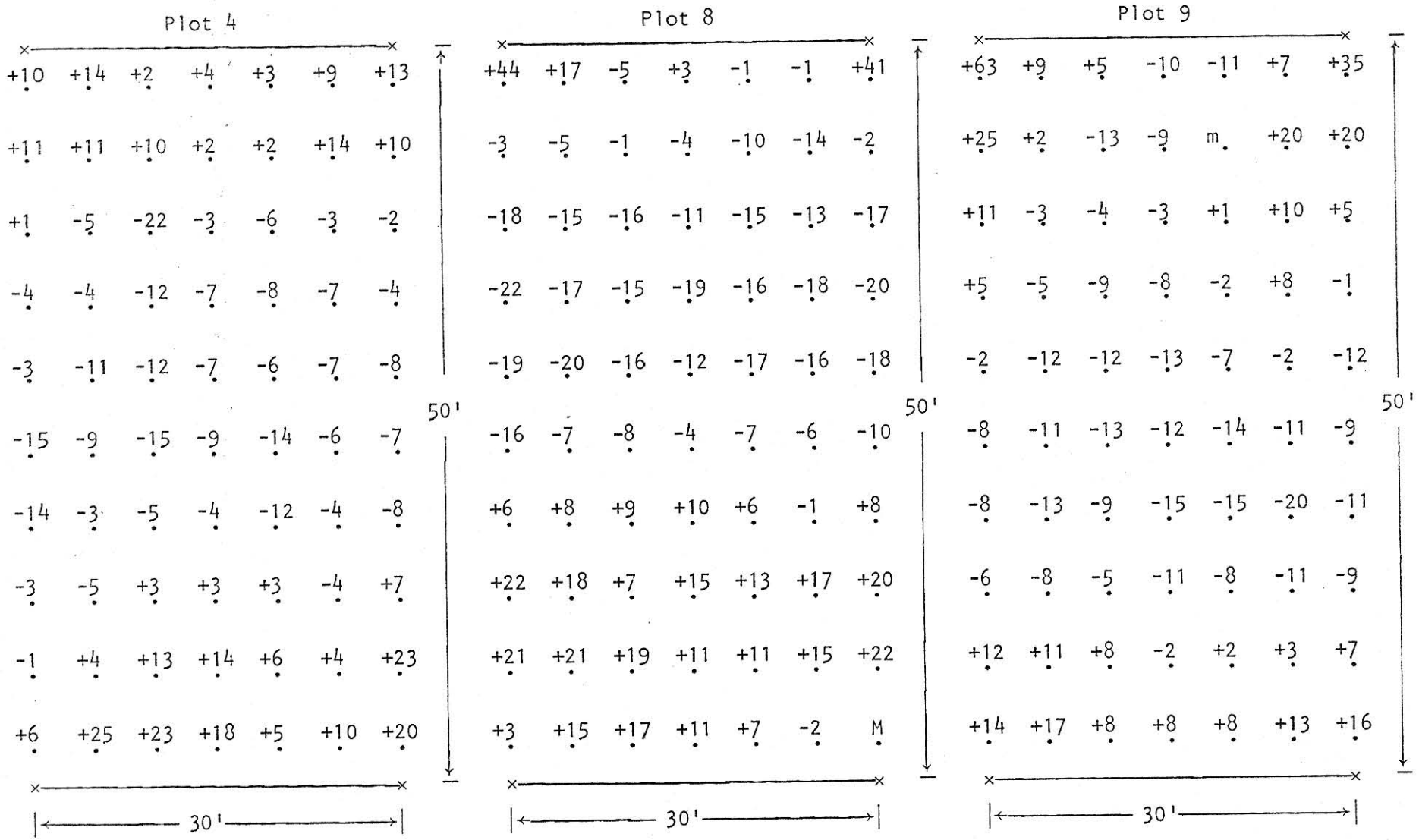


Fig. 14. Spatial distribution of deviations from the mean for uniformity coefficient tests.

(X) is the absolute value of the deviation of an individual observation from the mean, (m) is the mean, and (n) is the number of observations.

The uniformity coefficients for the three plots were calculated to be 78% for Plot 4, 73% for Plot 8, and 75% for Plot 9. The spacial distribution of the deviations from the means, rounded to the nearest ml, are presented in Fig. 14.

It appears from the calculations that the uniformity coefficient of the system is slightly below the value that it was designed for. It is important to note here that, on the day these tests were made, there was a 15-25 mph NW wind blowing which would tend to decrease the uniformity of application.

WATER QUALITY

The water that will be used for irrigating the plots was tested by the Colorado State University Soils Laboratory, and the results are presented in Table 17. The results show that the water is fairly safe for irrigation. The salinity hazard is medium, and the sodium hazard is low.

RESEARCH OBJECTIVES AND PROCEDURES FOR 1971

The overall objective is to determine as completely as we can the effects of the disruption of the shortgrass ecosystem by fertilization, irrigation, and a combination of the two.

If we are to do this, we must have a definite plan for both our treatments and sampling methods. As was discussed previously, the fertilization treatment has been decided upon and was begun in 1970, but the irrigation treatment has not been decided upon. It is also felt that the methods for measuring aboveground yield were not adequate for the objective of the project.

Table 17. Results of chemical analysis of irrigation water. [a/]

Conductance 499 micromhos (E.C. × 10^6) pH 7.9

Cations	*Parts Per Million*	*Equivalents Per Million*		
Calcium	44.1	2.2		
Magnesium	13.4	1.1		
Sodium	43.3	1.88		
Potassium	4.5	0.12		
Anions				
Carbonate	--	--		
Bicarbonate	229.4	3.76		
Chloride	9.9	0.28		
Sulfate	51.8	1.08	46.93	lbs. SO_4 sulfur per acre foot
Nitrate	5.6	0.09	3.47	lbs. NO_3 nitrogen per acre foot

SAR 1.5

Salinity Hazard Medium

Sodium Hazard Low

Comments: This water does not indicate any particular problems other than that the salinity hazard is medium. Under normal conditions, the water could be used as supplemental irrigation water. If the internal soil drainage is very good and the water can leach through, it can be used as the total water supply. Plants with moderate salt tolerance can be grown in most cases without special practices for salinity control.

[a/] Colorado State University Soils Laboratory.

Other samples that will be necessary are: changes in soil moisture content, species composition and percent cover of the vegetation, insect biomass and species composition, soil nitrogen, soil microorganisms, and small mammal biomass. Additional information desired includes data on micrometeorology and photosynthesis on the four treatment combinations.

There are several alternatives for the irrigation treatment, and all of them must be examined in the light of the limitations of the water supply. During the period of testing in August and September, the average rate of application was 2.708 mm of water per hour with a standard deviation of 0.3888. If we assume that we can irrigate for 8 to 10 hours a day which is about the capacity of the well, we can apply 21.7 to 27.1 mm of water per night.

One type of treatment that could be applied but may come close to or exceed the capacity of the system would be to maintain soil water potential in the irrigated plots between 0.1 and 0.8 bars. This could be done by using tensiometers and beginning irrigation when soil water potential reached 0.8 bars and stopping at 0.1 bars. If we use a figure of 640 mm per year for potential evapotranspiration and a figure of 252 mm as annual average growing season precipitation, then we must apply 388 mm to four plots for the growing season since essentially all of the potential evapotranspiration occurs during the April to October period. The maximum demand for water will occur during June, July, and August. The July potential evapotranspiration may well be 160 to 190 mm of water. This means we will have to supply 640 to 760 mm of water to the plots during this time period. At a rate of nine hours per night we could apply 755 mm of water, and at 10 hours per night 840 mm of water could be applied for the month of July. It appears that,

with a combination of 9- and 10-hour irrigation times, we could supply the plants with adequate water.

Another type of treatment that could be used would be an augmentation of precipitation by a predetermined percentage. As an example, if we wanted to double precipitation, each time it rained we would apply the same amount of water by irrigation. No attempt would be made to interfere with periods of drought.

A treatment that may be more applicable to the two plots not included in the present treatment regime, or could be used in conjunction with another irrigation treatment, would be to use the sprinkling system to modify leaf temperatures and vapor pressure near the soil surface. Critical temperatures could be set for both daytime and nighttime. Daytime temperature modification would tend to increase photosynthesis and nighttime modification would decrease respiration rates.

The objectives in aboveground plant yield sampling are to obtain statistically reliable estimates of the yields of the major species found on the study area, an estimate of total standing dead, and if possible, estimates of species composition of standing dead and estimates of total litter and species composition of the litter. From these data, we will be able to estimate net primary production exclusive of herbivorous consumption, transfer rates from standing live to standing dead, standing dead to litter, and decomposition of litter. An attempt will be made to estimate the amount of material that is added to the standing dead during the period when the standing live yield is increasing or growth that takes place while the standing live yield is decreasing.

The methods that are currently under consideration are: field estimates of percent species composition and clipped quadrats for total yield; clipped

quadrats for total yield using microscope slide analysis for species composition; laboratory estimates of species composition by subsampling clipped quadrats; combination of separation by species in the field and laboratory estimates of species composition by subsampling; complete separation by species in the field; and prediction of weight composition using point analysis.

Although these methods will have to be field tested on the system stress site, past experience enables us to eliminate several of these and also to predict the ones most likely to yield the kind of information we require. Field estimates of species composition and clipped quadrats for total yield will probably not be accurate enough. The complete field separation by species method would probably be most desirable in terms of accuracy, but will have to be eliminated from consideration because of the prohibitive time factor. Clipped quadrats for total yield and microscope slide analysis for species composition would suit all of our purposes except for the inability of the method to distinguish between live and dead material. If this problem could be solved by staining, it may be very useful. Laboratory estimation of species composition by subsampling appears to be one of the most promising methods under consideration, except for the problem that would be created by the forbs and shrubs. Forbs and shrubs could be separated by species rapidly in the field, and the species composition of the grasses could be satisfactorily estimated in the laboratory. The method of estimating would also involve separating some of the subsamples to obtain corrections for estimates. The prediction of weight composition by point analysis will have to be tested to determine its applicability.

The difficulty of collecting litter equally on each quadrat clipped will be approached by using a vacuum cleaner. The plots will be vacuumed after all of the standing material has been removed.

APPENDIX A

"FIRST PASS" DATA FOR THE ABOVEGROUND HERBAGE, 1970

Aboveground Biomass Data

The Pawnee Site aboveground biomass data collected in 1970 is Grassland Biome data set number A2U005B. A description and a sample of these data follow:

Column	Contents
I. *Header card - for each watershed on each date.*	
2 - 3	Month of collection.
4 - 5	Day of collection.
6 - 7	Day of collection.
8 - 9	Watershed number.
10 - 27	Alphameric identification.
II. *Estimated weight cards - one for each species encountered.*	
1 - 2	Coordinates of clipped plot location.
3 - 4	A sequential number for this string of estimated weight plots associated with one clipped plot.
5 - 8	Alphameric genus - species code.
10 - 13	Estimated weight (in grams per quarter meter square plot) on the first estimated only plot.
16 - 19	As above for second estimated plot.
22 - 24	As above for third estimated plot.
27 - 29	As above for fourth estimated plot.
32 - 34	As above for fifth estimated plot.

Column	Contents
37 - 39	As above for sixth estimated plot.
68 - 70	As above for estimated weight on estimated and clipped plot.
III. *Trailer card.*	
3 - 4	99--to indicate end of estimated weight cards for that watershed.
IV. *Clipped weight cards - one for each species found on the clipped plots.*	
3 - 4	String number - corresponds to columns 3 through 4 of the estimated weight cards.
5 - 8	Alphameric genus - species code.
10 - 11	Clipped plot coordinates - corresponds to columns 1 through 2 of the estimated weight cards.
12 - 21	Green clipped weight in g/plot.
22 - 31	Oven dried weight in g/plot.
V. *Trailer card.*	
1 - 2	Blank if not the last watershed sampled on that date. 98 if the last watershed sampled on that date but more dates follow. 99 if no more dates follow.
3 - 4	99 to signal end of information for that watershed.
Card types I through V are repeated for each watershed on each date.	

A listing of the data from the first date sampled in 1970 follows:

+++ EXAMPLE OF DATA +++

```
        1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

 04097001STANDING CROP DATA
11 1EREF                                  2
11 1OECO                                                                   .2
11 1BOGR    6     6     4     8     6                                       6
11 1LITR   10    12    15    20     8                                      10
11 1OPPO               100
11 1SPCO               .5
11 1ASTR                                                                   1
11 1MUDI                                                                   .5
72 2ARLO   .2
72 2BOGR    8     8    10     6     8                                       5
72 2CAHE   .2           .5    .2    .2
72 2LITR   10    12    15    12    20                                      15
72 2EREF                                  2                                1
72 2LOOR   .5           .2    .2
72 2CIUN         .5
72 2PEAL               .5
73 3BOGR    5     8     8     3     8                                       8
73 3BUDA   .5                 2                                          .2
73 3LITR   12    15           12    12                                      10
73 3OECO               .2
73 3MUDI               .5
25 4BOGR    7     6     6     8     6                                       6
25 4CAHE   .5    .2                                                       .2
25 4LITR   10     8     9   100    10                                      12
25 4EREF         1
25 4OPPO                     160
25 4SPCO         .2          .5    .2
25 4MUDI   .2
25 4TOGR         1
27 5BOGR    6     4     4     8     8                                       5
27 5CAHE   .5    .5
27 5LITR   10    12    15    12    20                                      10
27 5EREF         1                                                         1
27 5OECO         .2
27 5SETR                                  2
27 5EVNU                                 .2
68 6BOGR    9     8     6     4     4                                       8
68 6CAHE                     .2
68 6LITR   30    20    15     8    10                                      12
68 6OPPO   20
68 6SPCO               .2
89 7BOGR    4     4     8     7     5                                       7
89 7CAHE   .2    .2           .2
89 7LITR   10    10    20    18    12                                      12
89 7MUDI   .2
```

```
69 8BOGR     4      4      3      4      2                                  4
69 8CAHE                                .2     .5                          1
69 8LITR    12     10      8     10     10                                 20
69 8OECO            .2
69 8ASTR                                                                   3
 99
   1BOGR 11          6.0           5.39
   4BOGR 25          3.0           2.65
   5BOGR 27          5.0           4.20
   6BOGR 68         10.5           9.20
   7BOGR 89          7.0           5.70
   8BOGR 69          6.5           5.83
   3BOGR 73          3.0           2.54
   2BOGR 72          3.5           3.23
   6CAHE 68          0.2           0.02
   4CAHE 25          0.2           0.01
   8CAHE 69          2.0           1.11
   6LITR 68         24.0          15.89
   2LITR 72          8.0           4.56
   5LITR 27         30.0          25.21
   7LITR 89         26.0          16.62
   1LITR 11         24.0          14.63
   4LITR 25         39.0          30.93
   3LITR 73         13.0           8.07
   8LITR 69         51.0          30.95
   1ASTR 11          2.0            .84
   8ASTR 69          8.5           5.02
   2EREF 72          0.5           0.15
   5EREF 27          1.0           0.86
   5OECO 27          0.2           0.01
   1OECO 11          0.2           0.01
   6OPPO 68          2.0           0.33
   4SPCO 25          0.2           0.10
   1MUDI 11          0.2           0.06
 99
 04097002 STANDING CROP DATA
13 1BOGR     5      6      6      4      3                                  7
13 1CAHE    .2      2     .2      3                                        .2
13 1LITR    12     12     40     50      8                                 45
13 1OPPO                                                                  30
13 1LOOR                           .2
22 2BOGR     8      4      4      8      8                                  4
22 2BUDA                                                                   3
22 2CAHE    .2      4     .2     .2     .5                                 .2
22 2LITR    55     30     35     22     35                                 25
22 2GUSA                                  1
22 2OECO                                                                  .2
22 2OPPO            30     20
22 2LOOR            .2
22 2MUDI                                  1
22 2ARFR     2
```

44	3ARLO	3						
44	3BOGR	4	6	8	4	6		6
44	3BUDA							.5
44	3CAHE		.2		.2			
44	3LITR	45	30	15	15	25		10
44	3ARFR					2		
44	30PPO	120	50			30		
44	3CYMO							1
53	4BOGR	6	8	10	10	8		10
53	4BUDA	1		2	1	2		
53	4CAHE		.5			.5		
53	4LITR	50	20	30	40	80		40
53	4GUSA	.2						
53	40PPO	40	5	20				30
53	4SPCO					.5		
53	4MAVI	30						
53	4MUDI		.2					
53	4CYMO				1			
82	5BOGR	4	6	10	12	4		8
82	5BUDA	1	2		1	3		
82	5CAHE				.5			.2
82	5LITR	12	20	80	60	30		20
82	5GUSA					2		
82	50PPO		30	40	80	10		
82	5SPCO							.2
63	6AGSM					10		
63	6ARLO					1		
63	6BOGR	8	10	10	8	10		4
63	6BUDA	1						2
63	6CAHE		.2					.2
63	6LITR	20	25	12	10	110		
63	60PPO		70		10	120		
63	6MUTO							6
91	7AGSM	1	1		8			
91	7ARLO	4		8				
91	7BOGR	7	6	8	6	4		8
91	7BUDA			1	1	.5		
91	7LITR	35	22	40	32	12		64
91	70ECO							.2
91	70PPO	65						95
91	7SETR	1						
91	7SPCO							.2
91	7MUDI	.5	.5	.2				
91	7CYMO					.2		
83	8AGSM			8	2	1		
83	8BOGR	10	6	10	8	3		8
83	8BUDA	1			1	6		1
83	8CAHE	.2		.2		.2		
83	8LITR	35	35	75	45	25		14
83	8GUSA							.2
83	80PPO		20		40	45		
83	8HASP	2						
83	8MUDI		.2			.2		
83	8CYMO			.2				
83	8LOOR							.2

```
 99
  2BOGR 22       9.0        7.92
  1BOGR 13      12.0       10.58
  4BOGR 53      14.0       13.97
  3BOGR 44       6.5        5.30
  8BOGR 83       4.5        4.35
  7BOGR 91      13.0       12.30
  5BOGR 82       8.5        8.30
  6BOGR 63      12.0       11.05
  2BUDA 22       3.0        2.45
  3BUDA 44       6.0        4.80
  6BUDA 63       4.0        3.28
  8BUDA 83       0.2        0.17
  2CAHE 22       0.2        0.10
  1CAHE 13       0.2        0.14
  6CAHE 63       0.2        0.01
  7CAHE 91       0.2        0.12
  5CAHE 82       0.2        0.19
  8CAHE 83       0.2        0.03
  6MUTO 63       5.5        7.84
  8LOOR 83       0.2        0.10
  7MAVI 91       3.0        0.55
  7MUDI 91       0.2        0.05
  2LITR 22      20.0        9.94
  1LITR 13     314.0      137.86
  3LITR 44      64.0       30.73
  4LITR 53     151.0       64.58
  6LITR 63      24.0       11.28
  7LITR 91     114.0       40.36
  5LITR 82      13.0        6.90
  8LITR 83       4.5        2.31
  8ARFR 83       0.2        0.13
  8GUSA 83       0.2        0.02
  2OECO 22       0.2        0.01
  7OECO 91       0.2        0.07
  1OPPO 13      88.0       53.78
  4OPPO 53      27.0        9.78
  7OPPO 91     148.0       74.10
  8OPPO 83       0.2        0.05
  2SPCO 22       0.5        0.25
  5SPCO 82       0.2        0.20
  7SPCO 91       0.4        0.20
  3CYMO 44       0.5        0.04
  7TOGR 91       3.7        1.25
 99
 04097003 STANDING CROP DATA
21 1BOGR    8     8     8    11    10                          6
21 1BUDA                          1
21 1CAHE                                                      .5
21 1LITR   28    80    15    65    80                         80
21 1OECO         .2
21 1OPPO   35    60          80    65                         40
21 1SPCO         .2
21 1LOOR         .2                                           .2
```

64 2BOGR	6	5	6	9	6		7
64 2LITR	25	12	15	35	18		12
64 2OECO		.2					.2
64 2OPPO				40			
64 2SPCO				.2			
64 2CAHE					1		
27 3BOGR	9	8	4	9			6
27 3CAHE							.2
27 3LITR	43	23	15	38	35		25
27 3OECO	.2						.2
27 3OPPO	40	10			40		120
27 3EVNU	.2						
27 3MUDI					.5		
46 4BOGR	6	10	9	10	12		4
46 4BUDA					1		
46 4CAHE					1		.2
46 4LITR	14	35	15	12			10
46 4OPPO					120		
39 5BOGR	3	10	5	7	3		8
39 5BUDA					.5		
39 5CAHE	1	.5			.2		.2
39 5LITR		120	35	90	10		
39 5OECO	.2		.2				.2
39 5OPPO	15	50	60	110			140
39 5SPCO	.2						
39 5MUDI			.2				.2
89 6ARLO		2	1				
89 6BOGR	9	6	2	4	3		5
89 6CAHE				.2			
89 6LITR	200		150	15	20		17
89 6OECO	.2	.2					
89 6OPPO	90	60	230		30		
89 6SPCO				.5			
89 6SCPA			2				
89 6SPCR			1				
89 6CAFI					1		
99 7BOGR	4	12	4	4	5		8
99 7CAHE			.5	.5			
99 7LITR	25	230	60	22	25		30
99 7OPPO		210	10	10	30		35
99 7SPCO		.5					
99 7BUDA					1		
87 8BOGR	12	4	6	8	4		10
87 8CAHE	1			.5	.2		.5
87 8LITR	175	12	120	83	15		200
87 8OECO	.2		.2				
87 8OPPO			80	30			110
87 8SPCO							.5
87 8LOOR	.2						
87 8CRYP		.2					
87 8MUDI			1				

```
99
 2BOGR 64        9.5          8.00
 1BOGR 21        9.5          8.30
 8BOGR 87        7.5          6.08
 7BOGR 99        6.5          5.28
 6BOGR 89        9.0          7.49
 4BOGR 46        4.0          3.59
 3BOGR 27        5.0          4.43
 5BOGR 39       10.0          9.31
 2LITR 64        2.0          1.15
 1LITR 21       71.0         43.34
 8LITR 87      148.0         86.88
 7LITR 99       15.0          9.53
 6LITR 89        7.0          4.37
 4LITR 46        6.0          3.91
 3LITR 27       72.0         39.31
 5LITR 39      113.0         62.82
 1BUDA 21        0.2          0.13
 1CAHE 21        2.0          1.23
 8CAHE 87        1.0          0.70
 4CAHE 46        0.2          0.10
 3CAHE 27        0.2          0.10
 5CAHE 39        0.2          0.10
 1SCPA 21        0.5          0.20
 2OECO 64        0.2          0.05
 3OECO 27        0.2          0.05
 1OPPO 21       20.0          6.00
 8OPPO 87      127.0         49.41
 7OPPO 99       44.0         16.39
 3OPPO 27       88.0         34.45
 5OPPO 39       96.0         35.75
 8SPCO 87        0.2          0.04
 4SPCO 46        0.2          0.01
 1LOOR 21        0.2          0.05
 7LOOR 99        0.2          0.10
 4MUDI 46        0.2          0.01
 5MUDI 39        0.2          0.10
 99
 04107004 STANDING CROP DATA
32 1ARLO                          2     8
32 1BOGR    6     4     8         8                                    8
32 1CAHE                   .5
32 1LITR   18    15    30        20    60                             25
32 1ARFR    1                                 2
32 1BAOP                                     .5
32 1LEDE                                                             1
32 1OECO    1
32 1OPPO                   40               35
32 1SPCO          .5
32 1LOOR                                                            .5
74 2AGSM          1
74 2ARLO          3     3                  .5
74 2BOGR    6     8     2     6            3                         8
74 2CAHE   .5    .2    .2                  .5
74 2LITR   25    25    20    35           25                        20
74 2BAOP                                                            .5
74 2EREF    1
74 2OECO    1                                                       1
74 2OPPO                   15    80       40
74 2CAFI                    2                                       2
74 2LOOR                          1
74 2THTR                          1
```

55	3ARLO	3		8	4			
55	3BOGR	6	6	2	3	6		8
55	3CAHE	.5		.2	.2	.2		
55	3LITR	50	25	60	20	50		20
55	3ARFR			15	6			
55	3OECO				.2	1		.2
55	3OPPO		40			40		
55	3SPCO		.2					
55	3GILA							.2
55	3LOOR		1					
58	4ARLO	2						4
58	4BOGR	6	3	8	4	4		9
58	4CAHE			.2	.2			.5
58	4LITR	50	20	80	40	20		45
58	4ARFR	8	4					1
58	4BAOP							2
58	4OECO		.5					
58	4OPPO			70				40
58	4SPCO					.2		
58	4MUTO				15			
58	4ASTR				6			
82	5ARLO	6	8			4		
82	5BOGR	4	3	6	4	4		4
82	5CAHE	.2	.2	.2				
82	5LITR	45	20	20	70	75		15
82	5ARFR					8		
82	5GUSA							3
82	5OPPO			30	45			2
82	5SPCO							.2
82	5LOOR				.5			
14	6ARLO	4		8	8	4		6
14	6BOGR	4	8	6	6	4		4
14	6CAHE	.2	.2	.2	.5	.5		.2
14	6LITR	45	30	25	30	25		25
14	6ARFR					2		
14	6GUSA	1			6			
14	6OECO	1						.5
14	6OPPO	10			60			30
14	6CAFI	1	2					
69	7ARLO	3		1	12	1		8
69	7BOGR	6	4	4	4	10		5
69	7CAHE	.2			.2			
69	7LITR	60	15	25	25	40		25
69	7ARFR					3		
69	7BAOP	1						
69	7OECO	1						
69	7OPPO			40		10		
69	7LOOR	1						
69	7TOGR			2	2			
69	7CAFI							2
69	7ASTR							.5

```
18 8ARLO          1                                                    5
18 8BOGR    4     3      8      8      6                               4
18 8CAHE                 .2     .5     .2                              .2
18 8LITR   20     20     15     20     25                              50
18 8ARFR          .5
18 8BAOP   .5     1
18 8EREF                                .5
18 8OECO                        .5     .5
18 8OPPO                                                               40
18 8SCPA                                                               .5
 99
  1BOGR 32        8.5           7.47
  3BOGR 55        7.0           6.25
  2BOGR 74        8.0           7.19
  4BOGR 58       12.5          11.18
  6BOGR 14        4.0           3.17
  5BOGR 82        5.5           5.11
  8BOGR 18        8.0           7.46
  7BOGR 69        6.5           5.63
  1LITR 32       55.0          25.22
  3LITR 55       18.0           8.60
  2LITR 74       26.0          13.40
  4LITR 58       82.0          39.36
  6LITR 14       54.0          24.32
  5LITR 82       27.5           8.67
  8LITR 18       88.0          42.80
  7LITR 69       18.0           8.62
  4ARLO 58       13.0          12.07
  6ARLO 14        4.5           3.85
  8ARLO 18       11.5          10.86
  7ARLO 69       19.0          15.59
  4CAHE 58        0.5           0.37
  6CAHE 14         .5            .40
  8CAHE 18         .5            .27
  7CAHE 69         .5            .26
  5BUDA 82        2.7           2.50
  8SCPA 18         .5            .21
  5SPCR 82         .5            .23
  7SPCR 69         .5            .17
  2CAFI 74         .5            .31
  8CAFI 18         .1            .01
  5CAFI 82         .1            .04
  7CAFI 69        2.0           1.42
  3ARFR 55        1.0            .10
  4ARFR 58        2.5           1.60
  7ASTR 69         .5            .15
  2BAOP 74        1.0            .86
  4BAOP 58        1.0            .91
  1OECO 32        1.5            .96
  2OECO 74         .5            .50
  8OECO 18         .2            .12
  5OECO 82        1.0            .58
  6OECO 14        1.0            .46
  3OECO 55         .5            .01
  4OECO 58         .1            .01
  8OPPO 18       30.0           8.93
  5OPPO 82        2.0            .88
  6OPPO 14       35.0           8.80
  4OPPO 58       42.0          16.64
  5SPCO 82         .5            .11
  1LOOR 32        1.0            .15
  5GUSA 82        3.5            2.1
 99
```

04117005 STANDING CROP DATA

51	1ARLO	5						
51	1BOGR	4	8	2	10	8		4
51	1CAHE				.5	.2		.2
51	1LITR	80	38	45	35	25		25
51	1ARFR			8	8			
51	1OECO							.2
51	1OPPO		10					
51	1SPCO		.2					
51	1CHNA			4				
61	2AGSM			1				
61	2ARLO		6	10		8		1
61	2BOGR	9	6	4	4	2		4
61	2CAHE	1				1		.2
61	2LITR	23	65	40	18	30		44
61	2ARFR	2	6			12		
61	2OECO				.2			
61	2OPPO		80					40
61	2SPCO			.5				.2
61	2LUPU			.5	1			
61	2MUTO					15		
61	2TROC							.2
92	3AGSM	1						
92	3ARLO	12		8				6
92	3BOGR	2	5	2	6	12		3
92	3CAHE					.2		
92	3LITR	53	80	40	15	20		
92	3ARFR	12	1					9
92	3OECO		.2	.2				
92	3OPPO	10	30	40				
92	3SPCO	.2			.2			
92	3SPCR		1	3				1
92	3LOOR		.5					
33	4BOGR	4	4	8	6	8		8
33	4CAHE	.2		.2	.5			.5
33	4LITR	20	18	90	50	90		30
33	4ARFR							1
33	4EREF	1						
33	4GUSA							4
33	4OECO		.5					
33	4OPPO			140	30	80		
33	4SPCO			.5		.5		
33	4LOOR	.2						.2
33	4SPCR	.5						
84	5ARLO					6		20
84	5BOGR	10	5	8	6	5		4
84	5CAHE	.2	.2	1	.2			.5
84	5LITR	100	25	100	15	54		30
84	5ARFR			4		6		
84	5OPPO	90		40				
84	5SPCO					.2		
84	5THTR							.5
84	5SPCR				.5			
84	5GILA					.2		

```
75 6AGSM                    1          2
75 6ARLO     8      6      20      6   12
75 6BOGR     5      3       2      3    5                                  10
75 6LITR    50     15     115     20   60                                  25
75 6ARFR     4      1              8    4
75 60PPO                   30
75 6SPCO                                                                  .5
75 6SPCR                    1                                              3
64 7ARLO                                3   14                             4
64 7BOGR     8     10       4     10    8                                  10
64 7AGSM                                4
64 7CAHE                   .5
64 7LITR    80     30      55     25   25                                  25
64 7ARFR             4      3            6
64 7BAOP                   .5
64 70PPO    80     40      40
64 7SPCO                                                                  .5
64 7SPCR     1
64 7LIPU                                    .5
64 7THTR                                    .5                            .2
14 8ARLO    .5              6     12    3                                   4
14 8BOGR     4      5       3     10    9                                  10
14 8CAHE             .2      1     .5   .5                                  .5
14 8LITR    20     15      50     45   47                                  35
14 8GUSA                                                                   4
14 80PPO             30     30
14 8GILA    .5
 99
   6BOGR 75      10.0          8.41
   5BOGR 84       8.0          7.53
   8BOGR 44      12.0         10.09
   7BOGR 64       9.0          7.83
   3BOGR 92       6.0          4.45
   2BOGR 61      12.0         10.90
   1BOGR 51       7.0          5.61
   4BOGR 33       7.0          6.30
   6LITR 75      59.0         19.21
   5LITR 84     114.0         33.36
   8LITR 14      84.0         22.87
   7LITR 64      54.0         15.05
   3LITR 92      66.0         18.34
   2LITR 61      54.0         17.58
   1LITR 51      38.0         10.77
   4LITR 33      38.0         10.91
   3ARLO 92      10.0          8.75
   8ARLO 14       9.0          8.12
   5ARLO 84      38.0         33.26
   7ARLO 64       7.0          6.19
   2ARLO 61       2.0          2.21
   5CAHE 84       1.0           .48
   8CAHE 14       3.5          3.05
   2CAHE 61        .5           .04
   1CAHE 51       1.0           .35
   4CAHE 33       1.0           .40
```

```
   6SPCR 75       3.0         2.16
   3SPCR 92        .5          .30
   6CAFI 75        .5          .09
   3ARFR 92      22.0        13.66
   4ARFR 33       2.0          .92
   6BAOP 75        .5          .08
   7BAOP 64        .5          .25
   8GUSA 14       5.0         3.13
   4GUSA 33       3.0         1.57
   60ECO 75        .5          .01
   10ECO 51       1.0          .52
   20PPO 61      24.0         7.67
   2PLPU 64        .1          .02
   8SPCO 14        .5          .05
   2SPCO 61        .5          .05
   4SPCO 33        .5          .05
   5THTR 84        .5          .16
   7THTR 64        .5          .01
   3TROC 92        .5          .10
   2TROC 61        .5          .02
   4LOOR 33        .5          .05
 99
 04117006 STANDING CROP DATA
52 1ARLO    8
52 1BOGR    5     6     6     5     6                                  5
52 1CAHE   .5     1    .5    .5    .5                                 .2
52 1LITR   30    20    20    20    30                                 18
52 10ECO               .2
52 10PPO                                 80                          10
52 1SPCO               .2              .2
52 1SPCR    1
52 1MUTO          20
62 2BOGR   10     8     7     4     8                                  4
62 2BUDA                              3
62 2CAHE   .5    .2                   .2                                .2
62 2LITR   35    20    20    18    30                                 15
62 20ECO          .2    .2                                            .5
62 20PPO                                 30                          30
62 2LOOR               .5    .2
74 3ARLO    1                          1                               3
74 3BOGR    6     9     8     6     6                                  8
74 3BUDA                              1
74 3CAHE.              .2                                             .2
74 3LITR   18    18    18    15    16                                 18
74 3GUSA               .5
74 30ECO                    .2
74 30PPO   10
74 3SPCO          .2
74 3MUTO   10
74 3LOOR                    .5
74 3ALDR                                                             .5
65 4BOGR    8    10     9     7     7                                  8
65 4CAHE   .2    .2    .2                 1
65 4LITR   15    20    16    15    20                                 15
65 40ECO                    1    .2
65 40PPO                                                             15
65 4SPCR          .5
```

```
78 5ARLO                          1
78 5BOGR    6      8     10      10      9                          8
78 5CAHE   .2      1     .2              1                         .2
78 5LITR   18     15     20      22     20                         15
78 5OECO                 .5
78 5SPCO   .2
78 5MUTO   20
78 5SPCR                                                          .2
59 6ARLO                                  1
59 6BOGR   10     11      9       8      7                          6
59 6LITR   20     20     12      60     18                         20
59 6OECO                                 .2
59 6OPPO           5            120
59 6LOOR                         .5     .5                         .5
59 6MUTO                                                          20
39 7BOGR   11      6      9       7     10                          7
39 7CAHE   .2      1                    .2                         .5
39 7LITR   18     11     14      12     20                         18
39 7ARFR                                 2
39 7BAOP                 .2
39 7MUTO   10
26 8ARLO                                                           1
26 8BOGR   10     11      9       7      4                          9
26 8CAHE          .2     .5       1      1
26 8LITR   18     19     15      18     10                         15
26 8SPCO   .5            .5              .2
26 8SCPA                                 2
 99
  8BOGR 26      9.0          7.65
  7BOGR 39     10.0          7.19
  5BOGR 78      9.0          6.70
  6BOGR 59     18.0          7.10
  4BOGR 65      9.0          7.67
  3BOGR 74      8.0          6.98
  2BOGR 62      9.0          7.76
  1BOGR 52      6.0          5.42
  8LITR 26     12.0          4.19
  7LITR 39     20.0          6.59
  5LITR 78     31.0         10.29
  6LITR 59     34.0         10.48
  4LITR 65     30.0          9.11
  3LITR 74     15.0          4.89
  2LITR 62     12.0          3.81
  1LITR 52     26.0          8.47
  8ARLO 26      1.5           .83
  3ARLO 74      2.5          2.32
  7CAHE 39      1.0           .35
  5CAHE 78       .5           .06
  3CAHE 74      1.0           .33
  1CAHE 52      1.0           .35
  6MUTO 59     24.0         19.96
  5SPCR 78       .5           .06
  6OECO 59       .5           .01
  2OECO 62      1.0           .21
  1OPPO 52     16.0          6.41
  2OPPO 62     12.5          4.55
  6SPCO 59       .5           .08
  3SPCO 74       .5           .12
  1SPCO 52       .5           .02
  6THTR 59       .5           .03
  3ALDR 74       .5           .01
 99
```

04147007 STANDING CROP DATA

14	1ARLO	15						
14	1BOGR	6	10	6	2	10		8
14	1BUDA		4					
14	1CAHE	2	1	1	.5			
14	1LITR	40	11	10	4	70		12
14	1OPPO	20		2		60		
62	2ARLO	5	2	8	3	2		14
62	2BOGR	6	5	5	6	8		6
62	2CAHE		.5			.1		
62	2LITR	50	8		10	12		10
62	2BAOP			4	2			
62	2OPPO	40		10				
62	2SPCR		1		4			
62	2MUTO			12				
62	2SAKA					.5		
72	3ARLO		2		20			5
72	3BOGR	4	8	8	10	14		10
72	3CAHE		2	.5				1
72	3LITR	10	12	10	65	22		20
72	3BAOP				1			
72	3OPPO				10			
72	3SPCO	.5						
72	3MUTO	14						4
72	3SPCR	2						
93	4ARLO		4	14	1			
93	4BOGR	10	12	15	8	8		14
93	4CAHE		3			1		2
93	4LITR	12	40	35	30	12		18
93	4BAOP							2
93	4OECO			1				
93	4OPPO			42				25
93	4SPCR	1						
93	4MUTO				25			
86	5ARLO	1		2				7
86	5BOGR	10	8	10	12	10		14
86	5BUDA					5		2
86	5CAHE	2	1	1	.5	1		1
86	5LITR	35	15	18	15	18		
86	5ARFR							4
86	5BAOP			1				
86	5SPCO					1		
86	5MUTO				5			
25	6AGSM					2		
25	6ARLO				3	30		
25	6BOGR	12	8	14	15	2		11
25	6BUDA				2			
25	6CAHE	1	.5		1			1
25	6LITR	20	15	20	25	50		18
25	6ARFR	6				10		
25	6OPPO	1						
77	7AGSM			2				
77	7ARLO		15	4				
77	7BOGR	6	5	12	10	10		15
77	7CAHE	1	1		.5	.5		.5
77	7LITR	15	55	15	12	15		20
77	7OPPO		20					30
77	7MAVI							15

```
49 8AGSM     2
49 8ARLO             3     5          10                                  1
49 8BOGR    15      15    12    15     8                                 12
49 8CAHE             1     2     1     2                                 .5
49 8LITR    40      20    15    25    20                                 10
49 8OECO             .1
49 8OPPO    20
49 8MUTO    15                        14
49 8SPCR                   4           4
49 8SAKA                                                                  1
  99
   5BOGR 86        8.5          7.65
   2BOGR 62        8.0          7.12
   3BOGR 72        7.0          6.22
   8BOGR 49       17.0         15.22
   6BOGR 25       11.5         10.58
   4BOGR 93       12.5         11.16
   1BOGR 14        8.5          6.71
   7BOGR 77       12.0         10.39
   5LITR 86       18.5          5.83
   2LITR 62       42.0         13.97
   3LITR 72       58.0         18.90
   8LITR 49       61.5         19.03
   6LITR 25       16.0          6.31
   4LITR 93       77.0         22.66
   1LITR 14       41.5         13.35
   7LITR 77       44.0         14.77
   5AGSM 86         .1           .01
   4AGSM 93         .5           .50
   5ARLO 86        5.0          4.55
   2ARLO 62        5.5          4.81
   3ARLO 72        8.0          7.05
   8ARLO 49        1.0           .99
   4ARLO 93         .5           .24
   7ARLO 77         .1           .17
   5BUDA 86        1.5          1.13
   8BUDA 49        4.0          3.67
   5CAHE 86        1.0           .56
   2CAHE 62        1.0           .32
   3CAHE 72        1.0           .27
   8CAHE 49        1.0           .33
   6CAHE 25        1.0           .54
   4CAHE 93        2.0          1.16
   7CAHE 77        1.0           .51
   3MUTO 72       13.5         11.94
   5ARFR 86        3.5          2.04
   4BAOP 93         .5           .34
   5OECO 86         .5           .05
   3OPPO 72         .5           .10
   4OPPO 93       46.0         11.07
   7OPPO 77       43.0         12.69
   8SAKA 49         .1           .02
   7MAVI 77       26.0          9.46
  99
```

04147008 STANDING CROP DATA

11 1AGSM	10					2
11 1ARLO	2		20			2
11 1BOGR	7	12	15	30	14	12
11 1CAHE		1	1	1		.1
11 1LITR	40	15	25	40	15	25
11 1ARFR						42
11 1BAOP			2			
11 10ECO				.5		.1
11 1SPCO				.5		
11 1THTR						.5
11 10RLU						1
14 2ARLO		2			4	8
14 2BOGR	20	15	8	20	25	15
14 2CAHE					.5	
14 2LITR	35	25	6	25	40	20
14 2ARFR	1					
14 2BAOP	4	3				
14 2SPCO						.5
14 2CAFI		5				
51 3ARLO				4		4
51 3BOGR	25	70	15	20	35	8
51 3CAHE	1				2	
51 3LITR	40	100	20	30	50	15
51 3ARFR			5			4
51 3BAOP				1		
51 30ECO		.5				
51 30PPO	10			10		
51 3STCO						2
44 4ARLO	1		2			
44 4BOGR	25	10	12	20	15	8
44 4CAHE	1	2			2	
44 4LITR	40	25	30	75	60	20
44 4ARFR				40		
44 4BAOP		1	4			
44 40ECO				5		
44 40PPO	15				40	
44 4SPCO		.5				.5
44 4MUTO			20			
44 4STCO				1		5
44 4CHNA					5	10
53 5ARLO	12	2	8		5	12
53 5BOGR	15	20	20	15	10	10
53 5CAHE			2	1	1	
53 5LITR	20	40	30	25	30	15
53 5ARFR						5
53 5BAOP			2			1
53 50ECO		.5				
53 50PPO				20	25	
53 5STCO		10		5		

```
04 6AGSM                                  2
04 6ARLO          2              15
04 6BOGR   25     10    25       12      20                                  35
04 6CAHE    1      2              1                                          .5
04 6LITR   40     50    50       30      35                                  45
04 6BAOP    2                              5
04 6OPPO          20              5
04 6SPCO                                                                    .5
04 6CHNA                30
93 7AGSM    2
93 7ARLO                5       10                                          2
93 7BOGR   35     25    20       12      40                                  12
93 7CAHE   .1      1     1                1                                  1
93 7LITR   60     35    30       15      60                                  40
93 7OPPO                        20                                          35
93 7ATCA                40                                                  45
82 8ARLO    2           75       5       5                                  35
82 8BOGR   15     35    10       15      12                                  15
82 8CAHE    1      2     1        1                                          1
82 8LITR   20     50   100       35      20                                  40
82 8ARFR           7               7
82 8BAOP           3
82 8OPPO                                                                    10
82 8SPCO                                        1
82 8STCO                                                                    15
 99
   1BOGR 11        8.0             5.81
   5BOGR 53        5.0             4.56
   8BOGR 82       22.0            20.34
   7BOGR 93       11.0             9.62
   3BOGR 51        5.0             4.48
   4BOGR 44       10.0             9.20
   6BOGR 04       29.0            27.11
   2BOGR 14       20.5            18.18
   1LITR 11       56.0            25.87
   5LITR 53       17.0             8.43
   8LITR 82       20.0             9.30
   7LITR 93       49.5            21.60
   3LITR 51        9.5             4.47
   4LITR 44        6.0             2.99
   6LITR 04       21.5            10.16
   2LITR 14       15.0             7.01
   1ARLO 11        2.5             2.17
   5ARLO 53       10.0             8.45
   8ARLO 82        9.0             8.35
   7ARLO 93        1.5              .97
   3ARLO 51        3.5             2.96
   2ARLO 14       10.5            10.00
   1CAHE 11         .1              .02
   5CAHE 53         .1              .10
   8CAHE 82        1.0              .75
   7CAHE 93        1.0              .72
   3CAHE 51         .1              .03
   4CAHE 44         .5              .15
   6CAHE 04         .2              .03
```

```
   5BUDA 53        .5         .31
   8STCO 82       9.5        8.79
   4STCO 44       3.0        2.30
   2STCO 14        .5         .06
   3STCO 51       1.5        1.14
   1ARFR 11      48.0       34.09
   5ARFR 53       5.5        3.33
   3ARFR 51       3.0        1.55
   7ATCA 93      22.0       16.93
   5BAOP 53       1.0         .63
   3BAOP 51        .5         .38
   4GUSA 44      10.0        7.50
   1OECO 11        .5         .01
   5OPPO 53        .5         .04
   8OPPO 82      12.5        3.92
   7OPPO 93      37.0       12.10
   3OPPO 51       1.0         .34
   6SPCO 04        .5         .14
   4SPCO 44        .5         .20
   2SPCO 14        .2         .03
   6LOOR 04        .2         .02
   1THTR 11        .1         .02
   1ORLU 11       2.5        2.00
   5MUDI 53        .5         .01
9899
```

Aboveground Data Description of Computer Output

Standing crop data of plants are given in two sets for each watershed (NWSD) by sampling dates. The first set begins with the month, day, and year followed by NWSD and STANDING CROP DATA. This first set of data refers to the estimated values, and column one gives the numbers of the clipped plots which are the same as those in column three of the second data set. The first digit in column one refers to the row, and the second digit refers to the column of a matrix with coordinates of 11 in the lower right hand corner. Column two gives the code names for the plants which are the first two letters of the genus and of the species. The third column of numbers are used for computer programming only and are the same as the numbers in column two of the second data set.

The following six columns of numbers are estimated values of grams per quarter meter squared for each of the species of plants, and these are numbered one through six. Columns one through five are estimated values for permanent plots. Column six gives the estimated values for species of plants in the clipped plots. All estimates are on a wet basis.

The second set of data for each watershed on a sampling date refers to the species of plants in the clipped plots. Column one begins under the heading CODE and has the list of coded plant names for each of the clipped plots. In column two the numbers are used for computer programming, and column three refers to the numbers of the clipped plots (which in set one are the same as column three and column one, respectively). The wet weights in column four and dry weights in column five are given in grams per quarter meter squared.

This same procedure is repeated for each of the watersheds on all sampling dates, consisting of the same columns and the two data sets.

Litter Data

Associated with aboveground data are the Pawnee Site litter data, which is Grassland Biome data set number A2U009B. A description and a listing of these data follow:

Columns	Contents
I. *Header card*	
1 - 2	Data type (52).
3 - 4	Site (11 for Pawnee).
7 - 12	Date--day, month, year.
13	Watershed number.
16 - 20	Observer's name.
43 - 44	Number of slides read per composited lab sample (for that watershed).
45 - 46	Number of fields per slide.
64	Number of data cards to follow for that slide (see II below).
66 - 67	Decade and year slides were read.
68 - 72	Lab number.
II. *Composition analysis cards - as needed.*	
1 - 63	Up to nine groups (as needed) of 7 columns each, with the first four columns of each group for the alphameric genus-species code and the last 3 for the number of fields in which that species was observed.

Columns	Contents
64	Number of data cards to follow for that slide (if any).
66 - 72	As on header card (I above).

III. *Trailer card.*

1 - 2	98 to signify end of information for that sampling date, with information from more dates following; or
	99 to signify that no more dates follow.

+++ DATA +++

```
          1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890
5211  0904701  URESK                              520                    1 70  500
BOGR 16BUDA  3UNKG  20PPO  5ARFR  2SPCO  1SEED  1PACH 14ENDO  20 70  500
5211  0904701  URESK                              520                    2 70  501
BOGR 12BUDA  2CAHE  3SPCR  1UNKG  10PPO  5ARFR  1KOSC  1PACH  71 70  501
ENDO  5                                                                 0
5211  0904701  URESK                              520                    2 70  502
BOGR 14BUDA  3CAHE  3SPCR  10PPO  6ARFR  2KOSC  1LAEU  2SEED  41 70  502
PACH 10ENDO  4                                                          0
5211  0904701  URESK                              520                    1 70  503
BOGR 17BUDA  2CAHE  3SPCR  1ARLO  2UNKG  10PPO  4KOSC  1PACH 100 70  503
5211  0904701  URESK                              520                    2 70  504
BOGR 15BUDA  5CAHE  2UNKG  10PPO  2ARFR  1SPCO  1LAEU  2SEED  11 70  504
PACH 14ENDO  1                                                          0
5211  0904702  URESK                              520                    1 70  505
BOGR  6BUDA  6CAHE  10PPO 19SEED  3PACH  2                               0 70  505
5211  0904702  URESK                              520                    1 70  506
BOGR  6BUDA  2CAHE  1AGSM  1UNKG  10PPO 19SEED  1PACH  4ENDO  10 70  506
5211  0904702  URESK                              520                    1 70  507
BOGR  4BUDA  4UNKG  10PPO 18SPCO  2SEED  2PACH  6ENDO  3                0      507
5211  0904702  URESK                              520                    1 70  508
BOGR  4UNKG  20PPO 17SEED  2PACH  1ENDO  1                               0 70  508
5211  0904702  URESK                              520                    1 70  509
BOGR  60PPO 18SPCO  1                                                   0 70  509
5211  1004703  URESK                              520                    1 70  510
BOGR  5ARLO  1UNKG  10PPO 20SPCO  1MAVI  2PACH  4                        0 70  510
5211  1004703  URESK                              520                    1 70  511
BOGR  6SPCR  10PPO 20MAVI  1PACH  2                                      0 70  511
5211  1004703  URESK                              520                    1 70  512
BOGR  5ARLO  10PPO 20MAVI  1ARTH  1PACH  1                              0 70  512
5211  1004703  URESK                              520                    1 70  513
BOGR  50PPO 20PACH  4                                                   0 70  513
5211  1004703  URESK                              520                    1 70  514
BOGR  70PPO 19PACH  1                                                   0 70  514
5211  1104704  URESK                              520                    1 70  515
BOGR 17AGSM  2ARLO  3CAHE  1BUDA  2UNKG  10PPO 10ARFR  1KOSC  10 70  515
5211  1104704  URESK                              520                    1 70  516
BOGR 17ARLO  3CAHE  2BUDA  10PPO 17ARFR  4SPCO  1PACH  3                0 70  516
5211  1104704  URESK                              520                    1 70  517
BOGR 13ARLO  2CAHE  1BUDA  1SPCR  10PPO 15ARFR  20ECO  1PACH  20 70  517
5211  1104704  URESK                              520                    1 70  518
BOGR 17AGSM  1ARLO  4CAHE  2BUDA  10PPO 17ARFR  4SPCO  10ECO  10 70  518
5211  1104704  URESK                              520                    2 70  519
BOGR 10AGSM  2ARLO  3CAHE  2BUDA  1SPCR  20PPO 16ARFR  3SPCO  11 70  519
OECO  1                                                                 0
5211  1104705  URESK                              520                    2 70  520
BOGR 20ARLO  5CAFI  1AGSM  1SPCR  10PPO  3ARFR  3SPCO  1ARTH  11 70  520
MOSS  1PACH  2                                                          0
```

```
5211  1104705  URESK                                  520                        2 70  521
BOGR 11ARLO 11CAFI  2SPCO  10PPO  6ARFR  3SPCO  3ARTH  1MOSS  21 70  521
PACH  4                                                                        0
5211  1104705  URESK                                  520                        1 70  522
BOGR 13ARLO  2CAFI  2AGSM  4SPCR  10PPO  7ARTH  1PACH  2       0 70  522
5211  1104705  URESK                                  520                        2 70  523
BOGR 12ARLO  6CAFI  3AGSM  2SPCR  20PPO  6ARFR  1SPCO  1SEED  11 70  523
MOSS  2PACH  1                                                                 0
5211  1104705  URESK                                  520                        1 70  524
BOGR 12ARLO  3CAFI  3AGSM  2SPCR  40PPO  3SPCO  3ARTH  1PACH  20 70  524
5211  1404706  URESK                                  520                        1 70  525
BOGR 15SPCR  2ARLO  1BUDA  20PPO  5PACH 10                                      0 70  525
5211  1404706  URESK                                  520                        1 70  526
BOGR 17SPCR  5BUDA  2CAHE  30PPO  5LUPU  2PACH  7                               0 70  526
5211  1404706  URESK                                  520                        1 70  527
BOGR 16SPCR  4ARLO  1BUDA  10PPO  7SPCO  1PACH  6                               0 70  527
5211  1404706  URESK                                  520                        1 70  528
BOGR 15SPCR  2ARLO  2BUDA  30PPO  6PACH  9                                      0 70  528
5211  1404706  URESK                                  520                        1 70  529
BOGR 18SPCR  4ARLO  10PPO  6PACH  4                                            0 70  529
5211  1404707  URESK                                  520                        1 70  530
AGSM  1ARLO  3BOGR 15SPCR  30PPO  5ARTH  1                                     0 70  530
5211  1404707  URESK                                  520                        1 70  531
ARLO  1BOGR 15SPCR  1CAHE  2BUDA  20PPO  8PACH  2                             0 70  531
5211  1404707  URESK                                  520                        1 70  532
AGSM  4ARLO  1BOGR 16CAHE  2BUDA  10PPO 12MOSS  2PACH  1                       0 70  532
5211  1404707  URESK                                  520                        2 70  533
AGSM  2ARLO  2BOGR 16SPCR  3CAHE  1BUDA  10PPO 12ARTH  1MOSS  11 70  533
ENDO  2                                                                        0 70  533
5211  1404707  URESK                                  520                        1 70  534
AGSM  1ARLO  4BOGR 16CAHE  2BUDA  30PPO  9ARTH  2MOSS  2                       0 70  534
5211  1404708  URESK                                  520                        2 70  535
ARLO  3BOGR 17AGSM  5BUDA  2SPCR  3CAHE  10PPO 12ARFR  7SPCO  11 70  535
ARTH  1PACH  1                                                                 0 70  535
5211  1404708  URESK                                  520                        1 70  536
ARLO  2BOGR 17BUDA  1SPCR  60PPO 14ARFR  5SPCO  2MOSS  1PACH  40 70  536
5211  1404708  URESK                                  520                        1 70  537
ARLO  1BOGR 16AGSM  1SPCR  60PPO  9ARFR  6SPCO  1PACH  1       0 70  537
5211  1404708  URESK                                  520                        2 70  538
ARLO  2BOGR 15AGSM  2BUDA  2SPCR  4CAHE  20PPO  9ARFR  5SPCO  41 70  538
PACH  1                                                                        0 70  538
5211  1404708  URESK                                  520                        2 70  539
ARLO  2BOGR 15AGSM  1SPCR  2CAHE  30PPO 13ARFR  3SPCO  1ARTH  11 70  539
MOSS  1PACH  2                                                                 0 70  539
98
5211  0505701  URESK                                  520                        1 70  325
ARLO  2BOGR 16SPCR  30PPO  2SEED  1PACH  8                                     0 70  325
5211  0505701  URESK                                  520                        1 70  326
ARLO  2BOGR 16SPCR  5CAHE  60PPO  4SPCO  4PACH  7                               0 70  326
5211  0505701  URESK                                  520                        2 70  327
ARLO  1BOGR 17SPCR  3CAHE  1BUDA  20PPO 11SPCO  2SEED  2ARTH  11 70  327
PACH  7MOSS  1                                                                 0 70  327
5211  0505701  URESK                                  520                        2 70  328
ARLO  1BOGR 19SPCR  5CAHE  5BUDA  4CAFI  10PPO  8SPCO  2EREE  11 70  328
PACH  8                                                                        0 70  328
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5211  0505701  URESK                                  520                    1 70  329
ARLO  3BOGR 14SPCR  4CAHE  1BUDA  20PPO  9SPCO  2PACH  4                    0 70  329
5211  0505702  URESK                                  520                    1 70  330
BOGR  8ARLO  1BUDA  1AGSM  1CAHE  10PPO 19EREF  1SPCO  1PACH  20 70  330
5211  0505702  URESK                                  520                    1 70  331
BOGR  7ARLO  1BUDA  1AGSM  1CAHE  2SPCR  10PPO 19SPCO  1PACH  50 70  331
5211  0505702  URESK                                  520                    1 70  332
BOGR  9CAHE  1SPCR  40PPO 20PACH  1                                         0 70  332
5211  0505702  URESK                                  520                    1 70  333
BOGR  5ARLO  1BUDA  1CAHE  1SPCR  10PPO 20PACH  1                          0 70  333
5211  0505702  URESK                                  520                    1 70  334
BOGR 12BUDA  3AGSM  1SPCR  10PPO 17SPCO  1PACH  1                          0 70  334
5211  0505703  URESK                                  520                    1 70  335
BOGR  9SPCR  1ARLO  1BUDA  10PPO 17PACH  2                                  0 70  335
5211  0505703  URESK                                  520                    1 70  336
BOGR  7BUDA  10PPO 15PACH  4                                               0 70  336
5211  0505703  URESK                                  520                    1 70  337
BOGR 10SPCR  2BUDA  10PPO 18                                               0 70  337
5211  0505703  URESK                                  520                    1 70  338
BOGR  6SPCR  10PPO 20PACH  3                                               0 70  338
5211  0505703  URESK                                  520                    1 70  339
BOGR  5SPCR  20PPO 17MOSS  1PACH  3                                        0 70  339
5211  0505704  URESK                                  520                    2 70  340
AGSM  4ARLO  6BOGR  7BUDA  1CAHE  2SPCR  3ARFR  2EREF  1KOSC  11 70  340
OECO  10PPO  7SPCO  2ARTH  2PACH  1                                        0 70  340
5211  0505704  URESK                                  520                    2 70  341
AGSM  3ARLO  8BOGR  7BUDA  1CAHE  5SPCR  4SCPA  1ARFR  1EREF  11 70  341
OECO  10PPO 11ARTH  1                                                      0 70  341
5211  0505704  URESK                                  520                    2 70  342
AGSM  1ARLO  3BOGR  6BUDA  2CAHE  1SPCR  2ARFR  60ECO  20PPO  81 70  342
ARTH  1                                                                    0 70  342
5211  0505704  URESK                                  520                    2 70  343
AGSM  1ARLO  5BOGR 10BUDA  2CAHE  1SPCR  4ARFR  1CHNA  10PPO 161 70  343
ARTH  3ENDO  1                                                             0 70  343
5211  0505704  URESK                                  520                    1 70  344
AGSM  4ARLO  3BOGR  9CAHE  3SPCR  5ARFR  50PPO 13ARTH  1PACH  10 70  344
5211  0505705  URESK                                  520                    2 70  345
AGSM  1ARLO  9BOGR 12SPCR  7STCO  1MUTO  1ARFR  5EREF  2KOSC  11 70  345
OPPO 130ECO  1SPCO  4ENDO  1                                               0 70  345
5211  0505705  URESK                                  520                    2 70  346
AGSM  2ARLO  6BOGR 13CAHE  1SPCR  5STCO  1ARFR  2EREF  10PPO 111 70  346
OECO  1SPCO  5MOSS  1                                                      0 70  346
5211  0505705  URESK                                  520                    1 70  347
AGSM  3ARLO  2BOGR 18SPCR  7ARFR  2EREF  10PPO 12MOSS  1ENDO  10 70  347
5211  0505705  URESK                                  520                    2 70  348
AGSM  3ARLO  3BOGR 11CAHE  2SPCR  1STCO  1ASTR  1EREF  10PPO 101 70  348
PACH  1ENDO  1                                                             0 70  348
5211  0505705  URESK                                  520                    2 70  349
AGSM  2ARLO  1BOGR 12CAHE  1SPCR  5STCO  1CHNA  1EREF  20PPO 101 70  349
SPCO  2                                                                    0 70  349
5211  0505706  URESK                                  520                    2 70  350
AGSM  1ARLO  1BOGR 12CAHE  5SPCR  2MUTO  1ARFR  30PPO 12SPCO  11 70  350
PACH  3                                                                    0 70  350
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5211  0505706  URESK                                  520                          1 70  351
ARLO  1BOGR  6BUDA  1CAHE  1SPCR  1CIUN  10PPO 11SPCO  6PACH  30 70  351
5211  0505706  URESK                                  520                          2 70  352
AGSM  1ARLO  2BOGR 17BUDA  1CAHE  1SPCR  3ARFR  10PPO  8SPCO  31 70  352
MOSS  2PACH  4                                                                     0 70  352
5211  0505706  URESK                                  520                          2 70  353
AGSM  1ARLO  1BOGR 18CAHE  3SPCR  2MUTO  10PPO  9SPCO  4MOSS  11 70  353
PACH  3                                                                            0 70  353
5211  0505706  URESK                                  520                          1 70  354
BOGR 16BUDA  1SPCR  1ARFR  10ECO  10PPO  4SPCO  4MOSS  1PACH  30 70  354
5211  0505707  URESK                                  520                          1 70  355
AGSM  1ARLO  3BOGR 13CAHE  1SPCR  3ARFR  30PPO  8SPCO  1       0 70  355
5211  0505707  URESK                                  520                          1 70  356
ARLO  4BOGR  8BUDA  1SPCR  2MUTO  1ARFR  1BAOP  10PPO 12SPCO  30 70  356
5211  0505707  URESK                                  520                          1 70  357
ARLO  3BOGR  8BUDA  1CAHE  2SPCR  5BAOP  10PPO 13SPCO  1       0 70  357
5211  0505707  URESK                                  520                          1 70  358
AGSM  1ARLO  3BOGR 14CAHE  1SPCR  2CHNA  10PPO 15              0 70  358
5211  0505707  URESK                                  520                          1 70  359
ARLO  2BOGR 13CAHE  4SPCR  4ARFR  1CHNA  20PPO 14SPCO  4PACH  10 70  359
5211  0505708  URESK                                  520                          1 70  360
AGSM  4ARLO  5BOGR 13CAHE  4SPCR  1STCO  10PPO  9SPCO  2ARTH  10 70  360
5211  0505708  URESK                                  520                          1 70  361
AGSM  1ARLO  2BOGR 11CAHE  5SPCR  4STCO  1ARFR  1BAOP  10PPO  40 70  361
5211  0505708  URESK                                  520                          1 70  362
ARLO  3BOGR 11CAHE  3SPCR  3MUTO  2ARFR  10PPO  9SPCO  1       0 70  362
5211  0505708  URESK                                  520                          1 70  363
AGSM  1ARLO  1BOGR 15CAHE  1SPCR  4STCO  1MUTO  10PPO  9SPCO  10 70  363
5211  0505708  URESK                                  520                          2 70  364
AGSM  2BOGR  9SPCR  3STCO  2ARFR  10ECO  10PPO  7SPCO  4ARTH  11 70  364
PACH  1                                                                            0 70  364
98
5211  2105701  URESK                                  520                          2 70  365
AGSM  1ARLO  1BOGR 17BUDA  1CAHE  2SPCR  8STCO  10PPO  3SPCO  31 70  365
PACH  2ENDO  1                                                                     0 70  365
5211  2105701  URESK                                  520                          1 70  366
AGSM  2BOGR 14BUDA  3SPCR  30PPO  4SPCO  4PACH  4               0 70  366
5211  2105701  URESK                                  520                          1 70  367
ARLO  1BOGR 14CAHE  4SPCR  6STCO  20PPO  6SPCO  4ARTH  1PACH  30 70  367
5211  2105701  URESK                                  520                          1 70  368
BOGR 15CAHE  2SPCR  60PPO  6SPCO  5PACH  7                     0 70  368
5211  2105701  URESK                                  520                          1 70  369
BOGR 16BUDA  4SPCR  8STCO  10PPO  7SPCO  4MOSS  1PACH  2       0 70  369
5211  2105702  URESK                                  520                          1 70  370
BOGR 14BUDA  1SPCR  6ARFR  20PPO 16PACH  5                     0 70  370
5211  2105702  URESK                                  520                          1 70  371
AGSM  1ARLO  1BOGR 12CAHE  2SPCR  4ARFR  20PPO 17PACH  6       0 70  371
5211  2105702  URESK                                  520                          1 70  372
AGSM  1BOGR 14CAHE  2ARFR  20ECO  10PPO 17PACH  4              0 70  372
5211  2105702  URESK                                  520                          2 70  373
ARLO  1BOGR 10CAHE  3SPCR  2CAFI  1ARFR  30PPO 13SPCO  1ARTH  11 70  373
PACH  3                                                                            0 70  373
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5211  2105702  URESK                                    520                          1 70  374
ARLO  3BOGR 10CAHE  2SPCR  4STCO  1ARFR  10PPO 14SPCO  2PACH  10 70  374
5211  2105703  URESK                                    520                          1 70  375
BOGR  4CAHE  1SPCR  10PPO 19ARFR  1SPCO  1                                        0 70  375
5211  2105703  URESK                                    520                          1 70  376
BOGR  5SPCR  3AGSM  1CAHE  2SPCO  20PPO 18ARFR  1ASTR  1ARTH  10 70  376
5211  2105703  URESK                                    520                          1 70  377
BUDA  1SPCR  2BOGR  4AGSM  10PPO 19SPCO  2SAKA  1PACH  1ARFR  20 70  377
5211  2105703  URESK                                    520                          1 70  378
BOGR  7AGSM  2SPCR  1CAHE  10PPO 20                                               0 70  378
5211  2105703  URESK                                    520                          1 70  379
ARLO  1BOGR  3AGSM  4CAHE  10PPO 20ARFR  1SPCO  1                                 0 70  379
5211  2105704  URESK                                    520                          2 70  380
AGSM  2ARLO  6BOGR 15CAHE  1SPCR  7STCO  2ASTR  1ARFR  3MILI  21 70  380
PSTE  10PPO  9SPCO  1                                                            0 70  380
5211  2105704  URESK                                    520                          2 70  381
AGSM  1ARLO  6BOGR 12CAHE  3CAFI  1SPCR  8STCO  2ASTR  20PPO  61 70  381
SPCO  1PACH  2ARFR  5                                                            0 70  381
5211  2105704  URESK                                    520                          2 70  382
ARLO  4BOGR 10CAHE  4SPCR  5ASTR  1ARFR  2MILI  10ECO  10PPO  61 70  382
SPCO  1                                                                          0 70  382
5211  2105704  URESK                                    520                          2 70  383
ARLO  3BOGR 15CAHE  3SPCR  5STCO  1ASTR  1ARFR  20PPO  8SPCO  11 70  383
ENDO  1                                                                          0 70  383
5211  2105704  URESK                                    520                          2 70  384
ARLO  5BOGR 15CAHE  2SPCR  8ARFR  3CHVI  10PPO  9SPCO  1ARTH  11 70  384
PACH  1                                                                          0 70  384
5211  2105705  URESK                                    520                          2 70  385
AGSM  1ARLO  2BOGR  8CAHE  2SPCR  2ARFR  30PPO 17SPCO  2ARTH  41 70  385
ENDO  2                                                                          0 70  385
5211  2105705  URESK                                    520                          2 70  386
AGSM  1ARLO  1BOGR  9CAHE  2SPCR  4ARFR  10PPO 16SPCO  2ARTH  11 70  386
ENDO  2                                                                          0 70  386
5211  2105705  URESK                                    520                          1 70  387
ARLO  2BOGR 10CAHE  1SPCR  5ARFR  10PPO 18SPCO  1ARTH  1ENDO  10 70  387
5211  2105705  URESK                                    520                          1 70  388
AGSM  2BOGR 11CAHE  1SPCR  5STCO  1ARFR  20PPO 15ARTH  2ENDO  10 70  388
5211  2105705  URESK                                    520                          2 70  389
ARLO  1BOGR  8CAHE  3SPCR  4STCO  1ARFR  20ECO  10PPO 18SPCO  21 70  389
ARTH  1                                                                          0 70  389
5211  2105706  URESK                                    520                          2 70  390
AGSM  1ARLO  3BOGR 12BUDA  1CAHE  2SPCR  5STCO  4MUTO  1ARFR  21 70  390
OECO  10PPO 11SPCO  1ARTH  1PACH  3                                              0 70  390
5211  2105706  URESK                                    520                          2 70  391
AGSM  2ARLO  2BOGR 16CAHE  3SPCR  4STCO  1ARFR  10ECO  20PPO 131 70  391
ARTH  2PACH  3                                                                   0 70  391
5211  2105706  URESK                                    520                          2 70  392
ARLO  2BOGR 13CAHE  2SPCR  4STCO  1MUTO  1ARFR  2CIUN  10PPO  81 70  392
ARTH  2MOSS  1PACH  5ENDO  1                                                     0 70  392
5211  2105706  URESK                                    520                          2 70  393
AGSM  1ARLO  4BOGR 18BUDA  1CAHE  1SPCR  4MUTO  1ARFR  20ECO  21 70  393
OPPO  9SPCO  1ARTH  1MOSS  1PACH  4                                              0 70  393
5211  2105706  URESK                                    520                          2 70  394
ARLO  3BOGR  6CAHE  4SPCR  6STCO  1ARFR  3BAOP  10PPO  8SPCO  11 70  394
ARTH  1PACH  5                                                                   0 70  394
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5211  2105707  URESK                                    520                          1 70  395
ARLO  2BOGR 12CAHE  6SPCR  2STCO  4ARFR  3BAOP  10PPO 17ENDO  20 70  395
5211  2105707  URESK                                    520                          2 70  396
ARLO  3BOGR 12BUDA  2CAHE  4SPCR  2STCO  2ARFR  20PPO 16SPCO  11 70  396
PACH  1ENDO  2                                                                       0 70  396
5211  2105707  URESK                                    520                          2 70  397
ARLO  2BOGR 13BUDA  1CAHE  7SPCR  4STCO  50PPO 19PACH  1ENDO  11 70  397
ARFR  2                                                                              0 70  397
5211  2105707  URESK                                    520                          1 70  398
AGSM  1ARLO  2BOGR 10CAHE  5SPCR  2STCO  4ARFR  10PPO 15ARTH  10 70  398
5211  2105707  URESK                                    520                          2 70  399
ARLO  2BOGR 11CAHE  4SPCR  5STCO  4ARFR  20PPO 17SPCO  1MOSS  11 70  399
PACH  1                                                                              0 70  399
5211  2105708  URESK                                    520                          2 70  400
AGSM  1ARLO  3BOGR  8BUDA  1CAHE  6SPCR  3STCO  1ARFR  20PPO 191 70  400
SPCO  2                                                                              0 70  400
5211  2105708  URESK                                    520                          1 70  401
ARLO  2BOGR 12CAHE  3SPCR  6STCO  1ARFR  10PPO 18SPCO  1PACH  20 70  401
5211  2105708  URESK                                    520                          1 70  402
ARLO  2BOGR 12CAHE  3SPCR  3ARFR  10PPO 18PACH  1                                   0 70  402
5211  2105708  URESK                                    520                          2 70  403
ARLO  1BOGR 14CAHE  1SPCR  6STCO  2ARFR  30PPO 18SPCO  1PACH  11 70  403
ENDO  1                                                                              0 70  403
5211  2105708  URESK                                    520                          1 70  404
ARLO  2BOGR 11CAHE  3SPCR  4STCO  3ARFR  30PPO 19SPCO  1PACH  10 70  404
98
5211  0306701  URESK                                    520                          2 70   90
ARLO  2BOGR 14CAHE  3SPCR  2STCO  2ASTR  1ARFR  70PPO  9SPCO  21 70   90
MOSS  1PACH  7ENDO  1                                                                0 70   90
5211  0306701  URESK                                    520                          2 70   91
ARLO  1BOGR 11CAHE  2FEOC  1SPCR  2STCO  4ARFR  20PPO  4SPCO  21 70   91
MOSS  1PACH 10                                                                       0 70   91
5211  0306701  URESK                                    520                          2 70   92
AGSM  1ARLO  3BOGR 11BUDA  2CAHE  3FEOC  1SPCR  5STCO  1ARFR  31 70   92
OPPO  7SPCO  1MOSS  1PACH 11                                                         0 70   92
5211  0306701  URESK                                    520                          1 70   93
BOGR 12CAHE  2SPCR  4STCO  1ARFR  50PPO  6SPCO  2PACH 11      0 70   93
5211  0306701  URESK                                    520                          1 70   94
BOGR 13CAHE  3FEOC  3SPCR  5ARFR  20PPO  5SPCO  2PACH 10ENDO  10 70   94
5211  0306702  URESK                                    520                          1 70   95
BOGR 10CAHE  1SPCR  6BUDA  1ARFR  20PPO 18SPCO  1ARTH  1PACH  40 70   95
5211  0306702  URESK                                    520                          2 70   96
ARLO  1BOGR  7CAHE  2SPCR  4BUDA  1ARFR  30PPO 18SPCO  1PACH  21 70   96
ENDO  1                                                                              0 70   96
5211  0306702  URESK                                    520                          1 70   97
BOGR  5CAHE  1SPCR  2BUDA  2ARFR  20PPO 19SPCO  1ARTH  1PACH  50 70   97
5211  0306702  URESK                                    520                          1 70   98
ARLO  1BOGR  7CAHE  3SPCR  3ARFR  40PPO 18SPCO  1PACH  5ENDO  10 70   98
5211  0306702  URESK                                    520                          1 70   99
BOGR  7CAHE  3SPCR  3ARFR  40ECO  10PPO 16SPCO  1PACH  2       0 70   99
5211  0306703  URESK                                    520                          1 70  100
BOGR  7SPCR  3ARFR  10PPO 19ARTH  1PACH  1                                         0 70  100
5211  0306703  URESK                                    520                          1 70  101
BOGR  7SPCR  2ARFR  10PPO 20ARTH  1                                                 0 70  101
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5211  0306703  URESK                                  520                    1 70  102
AGSM  2BOGR  6CAHE  1SPCR  3ARFR  10PPO 19                                   0 70  102
5211  0306703  URESK                                  520                    1 70  103
ARLO  1BOGR  4SPCR  5ARFR  10PPO 19MOSS  1PACH  1ENDO  1                    0 70  103
5211  0306703  URESK                                  520                    1 70  104
AGSM  1ARLO  1BOGR  9SPCR  2ARFR  1CIUN  10PPO 20PACH  2ENDO  10             70  104
5211  0306704  URESK                                  520                    2 70  105
AGSM  1ARLO  3BOGR 14CAHE  5SPCR  5ARFR  50PPO 11SPCO  1ARTH  11             105
PACH  1                                                                     0 70  105
5211  0306704  URESK                                  520                    1 70  106
ARLO  3BOGR 10CAHE  3SPCR  6ARFR  60PPO 11ARTH  1MOSS  1                    0 70  106
5211  0306704  URESK                                  520                    1 70  107
AGSM  2BOGR 14CAHE  1SPCR  4ARFR  30PPO 11SPCO  1PACH  1                    0 70  107
5211  0306704  URESK                                  520                    1 70  108
ARLO  1BOGR 14BUDA  1CAHE  3SPCR  6ARFR  60PPO 11SPCO  2MOSS  10             70  108
5211  0306704  URESK                                  520                    2 70  109
AGSM  1ARLO  3BOGR 13CAHE  4SPCR  4ARFR  50PPO  9SPCO  1ARTH  21             70  109
PACH  2                                                                     0 70  109
5211  0306705  URESK                                  520                    2 70  110
BOGR 11CAHE  5SPCR  7AGSM  1ARLO  2STCO  2BUDA  1SPCO  2ARFR  31             70  110
OPPO  8                                                                     0 70  110
5211  0306705  URESK                                  520                    2 70  111
BOGR  9CAHE  1SPCR  8AGSM  1ARLO  2STCO  30PPO  8ARFR  4SPCR  11             70  111
ARTH  1ENDO  1                                                              0 70  111
5211  0306705  URESK                                  520                    2 70  112
BOGR 14CAHE  3SPCR  3ARLO  1STCO  20PPO 10ARFR  1SPCO  1PACH  31             70  112
HAIR  1MOSS  1                                                              0 70  112
5211  0306705  URESK                                  520                    2 70  113
BOGR  8CAHE  3SPCR  4ARLO  2STCO  2BUDA  10PPO  9ARFR  3SPCO  11             70  113
ARTH  2                                                                     0 70  113
5211  0306705  URESK                                  520                    1 70  114
BOGR 10CAHE  3SPCR  3ARLO  3STCO  10PPO 12ARFR  4SPCO  3ARTH  20             70  114
5211  0306706  URESK                                  520                    2 70  115
BOGR 16CAHE  4ARLO  2SPCR  3BUDA  2AGSM  20PPO  7SPCO  3CHNA  11             70  115
ASTR  1ENDO  2ARTH  1                                                       0 70  115
5211  0306706  URESK                                  520                    2 70  116
BOGR 18SPCR  5STCO  2CAHE  6BUDA  10PPO  3SPCO  4CHNA  3PACH  11             70  116
ARTH  2                                                                     0 70  116
5211  0306706  URESK                                  520                    2 70  117
BOGR 18CAHE  6SPCR  7ARLO  2AGSM  10PPO  4SPCO  2CHNA  1PSTE  11             70  117
PACH  4                                                                     0 70  117
5211  0306706  URESK                                  520                    2 70  118
BOGR 17CAHE  2SPCR  5ARLO  0AGSM  10PPO  6SPCO  3CHNA  1PSTE  11             70  118
PACH  2ARTH  1                                                              0 70  118
5211  0306706  URESK                                  520                    2 70  119
BOGR 18CAHE  4SPCR  4ARLO  2AGSM  1STCO  2BUDA  30PPO  5SPCO  41             70  119
PSTE  1PACH  4                                                              0 70  119
5211  0306707  URESK                                  520                    2 70  120
BOGR 12SPCR  1STCO  1CAHE  4ARLO  20PPO  8ARFR  2SPCO  2EVNU  11             70  120
ARTH  1ENDO  1MOSS  2                                                       0 70  120
5211  0306707  URESK                                  520                    2 70  121
BOGR 12SPCR  4CAHE  1AGSM  1ARLO  1BUDA  10PPO 12ARFR  1MILI  11             70  121
PACH  2MOSS  1                                                              0 70  121
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5211  0306707  URESK                              520                    1 70   122
BOGR 14SPCR  4CAHE  6ARLO  10PPO 11ARFR  2SPCO  1EVNU  1PACH  10 70   122
5211  0306707  URESK                              520                    1 70   123
BOGR 13SPCR  7STCO  1CAHE  5MUTO  10PPO 11CHNA  2ARTH  1       0 70   123
5211  0306707  URESK                              520                    1 70   124
BOGR 16SPCR  6CAHE  5ARLO  10PPO 14ARFR  1EVNU  2PSTE  1PACH  10 70   124
5211  0306708  URESK                              520                    1 70   125
BOGR 19SPCO  7STCO  2CAHE  10PPO 10ARFR  2PACH  1               0 70   125
5211  0306708  URESK                              520                    1 70   126
BOGR 18SPCR 10ARLO  1CAHE  20PPO  9ARFR  1                      0 70   126
5211  0306708  URESK                              520                    1 70   127
BOGR 17SPCR  6ARLO  2CAHE  4STCO  20PPO  7ARFR  1MOSS  1PACH  10 70   127
5211  0306708  URESK                              520                    1 70   128
BOGR 15SPCR  9ARLO  1STCO  1CAHE  40PPO  7ARFR  2SPCO  1MOSS  20 70   128
5211  0306708  URESK                              520                    1 70   129
BOGR 15SPCR  7CAHE  20PPO 10ARFR  2                              0 70   129
98
5211  1606701  URESK                              520                    1 70    50
BOGR 18SPCR  7CAHE  20PPO  3ARFR  3ENDO  1PACH 12ARTH  1       0 70    50
5211  1606701  URESK                              520                    1 70    51
BOGR 13SPCR  3CAHE  20PPO  4ARFR  1PACH  3ARTH  1               0 70    51
5211  1606701  URESK                              520                    1 70    52
BOGR 12SPCR  5CAHE  1ARLO  10PPO  7ARFR  1PACH  8               0 70    52
5211  1606701  URESK                              520                    1 70    53
BOGR 13SPCR  6CAHE  3ARLO  10PPO  8ARFR  4PACH  3               0 70    53
5211  1606701  URESK                              520                    1 70    54
BOGR 14SPCR  7CAHE  4ARLO  10PPO  4ARFR  3PACH  1               0 70    54
5211  1606702  URESK                              520                    1 70    55
BOGR  5CAHE  1AGSM  1ARLO  10PPO 14                              0 70    55
5211  1606702  URESK                              520                    1 70    56
BOGR  7AGSM  10PPO 11SPCO  2                                   0 70    56
5211  1606702  URESK                              520                    1 70    57
BOGR  80PPO 10ARFR  1                                          0 70    57
5211  1606702  URESK                              520                    1 70    58
BOGR  2ARLO  1ARFR  10PPO 16SPCO  2                            0 70    58
5211  1606702  URESK                              520                    1 70    59
BOGR  7AGSM  30PPO 10SPCO  1                                   0 70    59
5211  1606703  URESK                              520                    1 70    60
BOGR  3AGSM  2CAHE  10PPO 15ARTH  2                           0 70    60
5211  1606703  URESK                              520                    1 70    61
BOGR  6STCO  10PPO 15SPCO  2ARTH  1                           0 70    61
5211  1606703  URESK                              520                    1 70    62
BOGR  70PPO 17SPCO  1                                          0 70    62
5211  1606703  URESK                              520                    1 70    63
BOGR  60PPO 16ARTH  1                                          0 70    63
5211  1606703  URESK                              520                    1 70    64
BOGR 10AGSM  10PPO 10ARFR  1SPCO  1                            0 70    64
5211  1606704  URESK                              520                    1 70    65
BUDA  1BOGR  6STCO  1ARLO  10PPO  8ARFR  4                     0 70    65
5211  1606704  URESK                              520                    1 70    66
BOGR  7STCO  1APLO  10PPO 11ARFR  5                           0 70    66
5211  1606704  URESK                              520                    1 70    67
BOGR  8STCO  2SPCR  1ARLO  20PPO  6ARFR  3                    0 70    67
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5211  1606704  URESK                                  520                          1  70   68
BOGR  6CAHE  2SPCR  2ARLO  20PPO  9ARFR  6SPCO  2                                0  70   68
5211  1606704  URESK                                  520                          1  70   69
BOGR  5STCO  4ARLO  1SPCR  10PPO  9SPCO  1ARFR  4                                0  70   69
5211  1606705  URESK                                  520                          1  70   70
ARLO  3BOGR  8CAHE  4ARFR  60PPO  6SPCO  5                                        0  70   70
5211  1606705  URESK                                  520                          1  70   71
AGSM  1ARLO  4BOGR  7STCO  3ARFR  40PPO  2SPCO  3                                 0  70   71
5211  1606705  URESK                                  520                          1  70   72
AGSM  1BOGR  6SPCR  5AGCR  1ARFR  20PPO  4SPCO  3ARTH  1                         0  70   72
5211  1606705  URESK                                  520                          1  70   73
ARLO  7BOGR 10CAHE  1SPCR  10PPO  2SPCO  2                                       0  70   73
5211  1606705  URESK                                  520                          1  70   74
ARLO  5BOGR  9CAHE  50PPO  4SPCO  3ARTH  2                                       0  70   74
5211  1606706  URESK                                  520                          2  70   75
BOGR 13ARLO  2CAHE  7SPCR  5AGSM  4STCO  20PPO  6PACH  2CHVI                     11  70   75
SPCO  1ARTH  1                                                                    0  70   75
5211  1606706  URESK                                  520                          1  70   76
BOGR 14CAHE 13SPCR  3ARLO  1AGSM  10PPO  3SPCO  1PACH  1                        0  70   76
5211  1606706  URESK                                  520                          1  70   77
BOGR 13SPCR  7CAHE  40PPO  6ARTH  2PACH  1SPCO  1MOSS  1                        0  70   77
5211  1606706  URESK                                  520                          1  70   78
BOGR 10CAHE  6SPCR  5STCO  1AGSM  5ARLO  10PPO  2PACH  2SPCO                    10  70   78
5211  1606706  URESK                                  520                          1  70   79
SPCR  4BOGR 12CAHE 10MUTO  1LUPU  10PPO  3PACH  1SPCO  2MOSS                    10  70   79
5211  1606707  URESK                                  520                          1  70   80
AGSM  1BOGR 12CAHE  1SCPA  1ARFR  60PPO  9SPCO  1ENDO  1                        0  70   80
5211  1606707  URESK                                  520                          2  70   81
AGSM  2ARLO  2BUDA  1CAHE  2SPCR  3STCO  2ARFR  20PPO  6MOSS                    11  70   81
BOGR 15                                                                           0  70   81
5211  1606707  URESK                                  520                          1  70   82
ARLO  1BOGR 13CAHE  1SPCR  3STCO  2ARFR  70PPO  7SPCO  4                        0  70   82
5211  1606707  URESK                                  520                          1  70   83
BOGR 10BUDA  2CAHE  1SPCR  4SCPA  1ARFR  20PPO  9SPCO  2                        0  70   83
5211  1606707  URESK                                  520                          2  70   84
BOGR  9BUDA  1SPCR  3SCPA  1ARFR  40PPO  7SPCO  1LEMO  1ARTH                    11  70   84
MOSS  1                                                                           0  70   84
5211  1606708  URESK                                  520                          1  70   85
AGSM  1ARLO  1BOGR 18SPCR  3STCO  1ARFR  40PPO  3SEED  1                        0  70   85
5211  1606708  URESK                                  520                          1  70   86
AGSM  1ARLO  3BOGR 13CAHE  3SPCR  5STCO  2ARFR  3CHNA  10PPO                    20  70   86
5211  1606708  URESK                                  520                          2  70   87
AGSM  1BOGR 15BUDA  2CAHE  1SPCR  3STCO  1ARFR  20PPO  6SPCO                    11  70   87
ARTH  2                                                                           0  70   87
5211  1606708  URESK                                  520                          1  70   88
ARLO  2BOGR 15BUDA  2CAHE  1SPCR  5STCO  1ARFR  2CHNA  10PPO                    60  70   88
5211  1606708  URESK                                  520                          1  70   89
BOGR 10SPCR  3STCO  1ARFR  6CHNA  10PPO  8MOSS  1                              0  70   89
98
5211  2906701  URESK                                  520                          1  70  405
AGSM  3BOGR 14BUDA  5CAHE  2SPCR  1ARFR  20PPO  1MOSS  1PACH                   40  70  405
5211  2906701  URESK                                  520                          1  70  406
BOGR 17BUDA  4CAHE  3SPCR  1ARFR  1KOSC  1SPCO  1PACH  1                        0  70  406
5211  2906701  URESK                                  520                          1  70  407
ARLO  1BOGR 16BUDA  1CAHE  4SPCR  2PACH  2                                       0  70  407
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5211  2906701  URESK                                  520                        1 70  408
BOGR 15BUDA  1CAHE  4SPCR  2EREF  10PPO  1SPCO  3PACH  6                       0 70  408
5211  2906701  URESK                                  520                        2 70  409
AGSM  1BOGR 16BUDA  1CAHE  2SPCR  4ARFR  1ASTR  1SPCO  4MOSS                  11 70  409
PACH  5                                                                        0 70  409
5211  2906702  URESK                                  520                        1 70  410
AGSM  5ARLO  2BOGR  6CAHE  2SPCR  30PPO  9SPCO  1PACH  2                      0 70  410
5211  2906702  URESK                                  520                        1 70  411
AGSM  2BOGR 11CAHE  1SPCR  10PPO  7PSTE  1                                     0 70  411
5211  2906702  URESK                                  520                        1 70  412
BOGR  9CAHE  4SPCR  1STCO  10PPO 12PACH  1                                     0 70  412
5211  2906702  URESK                                  520                        1 70  413
AGSM  3BOGR  8CAHE  1SPCR  10PPO 11                                            0 70  413
5211  2906702  URESK                                  520                        1 70  414
AGSM  6BOGR  8CAHE  1STCO  10PPO  9SPCO  2                                    0 70  414
5211  2906703  URESK                                  520                        1 70  415
BOGR  7BUDA  1SPCR  20PPO 20SPCO  1                                           0 70  415
5211  2906703  URESK                                  520                        1 70  416
BOGR  6BUDA  10PPO 14SPCO  3ARTH  1                                           0 70  416
5211  2906703  URESK                                  520                        1 70  417
BOGR  9BUDA  1CAHE  3SPCR  20PPO 19SPCO  2                                    0 70  417
5211  2906703  URESK                                  520                        1 70  418
ARLO  1BOGR  7CAHE  10PPO 15                                                   0 70  418
5211  2906703  URESK                                  520                        1 70  419
BOGR  9CAHE  2SPCR  20PPO 16                                                   0 70  419
5211  2906704  URESK                                  520                        1 70  420
AGSM  2ARLO  2BOGR 10CAHE  3SPCR  30PPO  8SPCO  1                             0 70  420
5211  2906704  URESK                                  520                        1 70  421
BOGR 12BUDA  1CAHE  2SPCR  3STCO  1ARFR  60PPO  5SPCO  1                      0 70  421
5211  2906704  URESK                                  520                        2 70  422
AGSM  1ARLO  2BOGR 10CAHE  1SPCR  3ARFR  2CHVI  10PPO  8SPCO                 11 70  422
MAVI  1                                                                        0 70  422
5211  2906704  URESK                                  520                        2 70  423
ARLO  2BOGR 10CAHE  2SPCR  2STCO  1ARFR  20PPO  6SPCO  1ARTH                 11 70  423
PACH  2                                                                        0 70  423
5211  2906704  URESK                                  520                        1 70  424
ARLO  2BOGR 11SPCR  1STCO  1ARFR  10PPO 10                                    0 70  424
5211  2906705  URESK                                  520                        1 70  425
ARLO  2BOGR 13BUDA  1CAHE  1STCO  1CHNA  10PPO  1SPCO  1                      0 70  425
5211  2906705  URESK                                  520                        1 70  426
ARLO  1BOGR 16BUDA  1ARFR  10PPO  3SEED  1                                     0 70  426
5211  2906705  URESK                                  520                        1 70  427
ARLO  2BOGR 14STCO  1ARFR  10PPO  2SPCO  2                                    0 70  427
5211  2906705  URESK                                  520                        1 70  428
ARLO  1BOGR 14CAHE  1ARFR  2CHNA  20PPO  3SPCO  3                            0 70  428
5211  2906705  URESK                                  520                        1 70  429
ARLO  1BOGR 13BUDA  2BARE  2SPBR  1ARFR  50PPO  3SPBO  2PABH                10 70  429
5211  2906706  URESK                                  520                        2 70  430
AGSM  2ARLO  1BOGR 15BUDA  1CAHE  2SPCR  60ECO  10PPO  3SPCO                 11 70  430
LICH  5                                                                        0 70  430
5211  2906706  URESK                                  520                        2 70  431
AGSM  1BOGR 16CAHE  2SPCR  3STCO  3FEOC  1EREF  20PPO  3SPCO                 11 70  431
MOSS  1LICH  2                                                                 0 70  431
5211  2906706  URESK                                  520                        2 70  432
AGSM  2ARLO  1BOGR 17CAHE  3SPCR  2EREF  20PPO  1LEDE  1MOSS                 21 70  432
LICH  2                                                                        0 70  432
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5211  2906706  URESK                                    520                    1 70  433
ARLO  1BOGR 15BUDA  1CAHE  3SPCR  5EREF  2LEDE  1ARTH  1LICH  30 70  433
5211  2906706  URESK                                    520                    1 70  434
BOGR 14BUDA  2CAHE  1SPCR  4EREF  20ECO  2LICH  1                0 70  434
5211  2906707  URESK                                    520                    2 70  435
AGSM  3ARLO  1BOGR 13CAHE  2SPCR  4MUTO  1CHNA  10PPO  4SPCO  11 70  435
MOSS  2                                                                        0
5211  2906707  URESK                                    520                    1 70  436
AGSM  2ARLO  1BOGR  9SPCR  3STCO  10PPO  8SPCO  1                0 70  436
5211  2906707  URESK                                    520                    2 70  437
AGSM  1ARLO  1BOGR 13CAHE  5STCO  2AREA  10PPO  9SEED  1ARTH  11 70  437
MOSS  1                                                                        0
5211  2906707  URESK                                    520                    1 70  438
AGSM  1BOGR 12CAHE  3SPCR  1STCO  2MUTO  1AREA  30PPO 10        0 70  438
5211  2906707  URESK                                    520                    1 70  439
ARLO  2BOGR 17CAHE  3SPCR  1AREA  50PPO  5SPCO  1                0 70  439
5211  2906708  URESK                                    520                    1 70  440
AGSM  4BOGR 16SPCR  3AREA  10PPO 10PEAL  1                       0 70  440
5211  2906708  URESK                                    520                    1 70  441
AGSM  7ARLO  3BOGR 13BUDA  1CAHE  2SPCR  5AREA  20PPO  8        0 70  441
5211  2906708  URESK                                    520                    1 70  442
AGSM  1BOGR 15BUDA  3CAHE  1SPCR  4STCO  3KOSC  10PPO  2SPCO  10 70  442
5211  2906708  URESK                                    520                    1 70  443
AGSM  5ARLO  3BOGR 14BUDA  2SPCR  7AREA  20PPO 11                0 70  443
5211  2906708  URESK                                    520                    1 70  444
AGSM  4ARLO  2BOGR 14CAHE  1SPCR  3STCO  10PPO  5                0 70  444
98
5211  1507701  URESK                                    520                    1 70  130
BOGR 15CAHE  3SPCR  2SCPA  2BUDA  10PPO  4PACH  3                0 70  130
5211  1507701  URESK                                    520                    2 70  131
BOGR 10SPCR  4BUDA  1CAHE  1FEOC  2SPCO  1EREF  1PACH  1MOSS  11 70  131
OPPO  1                                                                        0 70  131
5211  1507701  URESK                                    520                    1 70  132
BOGR 12SPCO  5CAHE  2BUDA  1SPCO  20PPO  2                      0 70  132
5211  1507701  URESK                                    520                    1 70  133
BOGR 15AGSM  1SPCR  1CAHE  3STCO  10PPO  3SPCO  1PACH  1        0 70  133
5211  1507701  URESK                                    520                    1 70  134
BOGR 12AGSM  1SPCR  4CAHE  6FEOC  20PPO  30ECO  1PACH  2        0 70  134
5211  1507702  URESK                                    520                    1 70  135
BOGR  9CAHE  1SPCR  20PPO 16PACH  2                             0 70  135
5211  1507702  URESK                                    520                    1 70  136
BOGR 13SPCR  1CAHE  10PPO 10PACH  3                             0 70  136
5211  1507702  URESK                                    520                    1 70  137
BOGR 10SPCR  20PPO 16                                                          0 70  137
5211  1507702  URESK                                    520                    1 70  138
BOGR 10CAHE  3ARLO  10PPO 10SPCO  2PACH  1                       0 70  138
5211  1507702  URESK                                    520                    1 70  138
BOGR 11SPCR  30PPO 12                                                          0 70  138
5211  1507703  URESK                                    520                    1 70  140
BOGR 10SPCR  4CAHE  20PPO 11PACH  1MOSS  1                       0 70  140
5211  1507703  URESK                                    520                    1 70  141
BOGR  6CAHE  20PPO 16                                                          0 70  141
5211  1507703  URESK                                    520                    1 70  142
BOGR  6CAHE  1ARLO  1SPCR  20PPO 12SPCO  2                       0 70  142
5211  1507703  URESK                                    520                    1 70  143
BOGR 11CAHE  1SPCR  30PPO 11ENDO  1                             0 70  143
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5211  1507703  URESK                                    520                    1 70  144
BOGR  7SPCR  30PPO 10PACH  1                                                   0 70  144
5211  1507704  URESK                                    520                    1 70  145
BOGR 12ARLO  3AGSM  1SPCR  20PPO  2ARFR  2EREF  1                             0 70  145
5211  1507704  URESK                                    520                    1 70  146
BOGR 13ARLO  4SPCR  3CAHE  2AGSM  10PPO  5SPCO  1ARFR  3                      0 70  146
5211  1507704  URESK                                    520                    1 70  147
BOGR  8ARLO  4SPCR  6CAHE  1STCO  10PPO  3LIPU  2ARFR  4PACH                  10 70  147
5211  1507704  URESK                                    520                    1 70  148
BOGR  9ARLO  4SPCR  3STCO  10PPO  4SPCO  1ARFR  5                             0 70  148
5211  1507704  URESK                                    520                    1 70  149
BOGR 10CAHE  2SPCR  10PPO  5ARFR  6SPCO  1                                    0 70  149
5211  1507705  URESK                                    520                    1 70  150
BOGR 13SPCR  4ARLO  2CAHE  1ARFR  1SPCO  20PPO  3                             0 70  150
5211  1507705  URESK                                    520                    1 70  151
BOGR 17SPCR  4CAHE  1ARLO  2AGSM  1ARFR  4SPCO  3EREF  20PPO                 40 70  151
5211  1507705  URESK                                    520                    1 70  152
BOGR 15SPCR  3ARLO  1CAHE  3AGSM  4ARFR  4SPCO  20PPO  3EREF                 10 70  152
5211  1507705  URESK                                    520                    2 70  153
BOGR 15SPCR  4ARLO  1CAHE  1FEOC  2AGSM  1ARFR  3SPCO  20PPO                 51 70  153
EREF  1MOSS  1ARTH  1SEED  1                                                   0
5211  1507705  URESK                                    520                    1 70  154
BOGR 15SPCR  3ARLO  3CAHE  1ARFR  20PPO  2SPCO  2                            0 70  154
5211  1507706  URESK                                    520                    1 70  155
BOGR 12STCO  1CAHE  3SPCR  2ARLO  10PPO 11ARFR  1PACH  2                     0 70  155
5211  1507706  URESK                                    520                    1 70  156
BOGR 14SPCO  3ARLO  10PPO  9ARFR  1PACH  1                                    0 70  156
5211  1507706  URESK                                    520                    1 70  157
BOGR 14SPCR  1ARLO  2CAHE  50PPO  9ARFR  1                                    0 70  157
5211  1507706  URESK                                    520                    1 70  158
BOGR 17SPCR  40PPO  6ARFR  1CHAL  1BAOP  1                                    0 70  158
5211  1507706  URESK                                    520                    1 70  159
BOGR 13SPCR  1CAHE  20PPO  8ARFR  1CHAL  1BAOP  1                            0 70  159
5211  1507707  URESK                                    520                    1 70  160
AGSM  2BOGR 12CAHE  2SPCR  3ARLO  10PPO  2ARFR  1ENDO  1                     0 70  160
5211  1507707  URESK                                    520                    1 70  161
BOGR 17SPCR  3ARLO  3CAHE  20PPO  1SPCO  2ARFR  1                            0 70  161
5211  1507707  URESK                                    520                    1 70  162
ARLO  1BOGR 13SPCR  4CAHE  1AGSM  10PPO  1SPCO  1ARFR  1                     0 70  162
5211  1507707  URESK                                    520                    1 70  163
ARLO  1BOGR 15BUDA  1SPCR  4CAHE  20PPO  3ARTH  1                            0 70  163
5211  1507707  URESK                                    520                    1 70  164
ARLO  3BOGR 14SPCR  2CAHE  20PPO  2LIIN  1ARFR  2                            0 70  164
5211  1507708  URESK                                    520                    1 70 1100
BOGR 16CAHE  1SPCR  1ARLO  20PPO 11SPCO  1                                    0 70 1100
5211  1507708  URESK                                    520                    1 70 1101
BOGR 11SPCR  3AGSM  10PPO  9ARFR  1                                          0 70 1101
5211  1507708  URESK                                    520                    1 70 1102
BOGR 13SPCR  30PPO  9SPCO  1                                                  0 70 1102
5211  1507708  URESK                                    520                    1 70 1103
BOGR  8SPCR  4AGSM  10PPO 14LYJU  1ARTH  1                                   0 70 1103
5211  1507708  URESK                                    520                    1 70 1104
BOGR 14SPCR  2ARLO  2AGSM  10PPO  9CHNA  1SEED  1                            0 70 1104
98
5211  2807701  URESK                                    520                    1 70  165
BOGR 11SPCR  6BUDA  10PPO  4ARFR  1PACH  1                                    0 70  165
5211  2807701  URESK                                    520                    1 70  166
BOGR 12CAHE  1SPCR  5AGSM  1ARFR  2PACH  4                                    0 70  166
5211  2807701  URESK                                    520                    1 70  167
BOGR 12CAHE  3SPCR  4AGSM  1ARFR  2SPCO  2PACH  6                            0 70  167
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5211  2807701  URESK                                          520                    1 70  168
BOGR 17BUDA  1SPCR  5ARFR  1SPCO  3PACH  1                                          0 70  168
5211  2807701  URESK                                          520                    1 70  169
BOGR 16CAHE  1BUDA  2SPCR  3AGSM  10PPO  1PACH  2             2                      0 70  169
5211  2807702  URESK                                          520                    1 70  170
BOGR  8SPCR  2CAHE  20PPO 11PACH  3                                                 0 70  170
5211  2807702  URESK                                          520                    1 70  171
BOGR  6SPCR  2CAHE  10PPO 14ARFR  1PACH  1                                          0 70  171
5211  2807702  URESK                                          520                    1 70  172
BOGR  6SPCR  1CAHE  2BUDA  1FEOC  10PPO 13SPCO  1ARTH  1                           0 70  172
5211  2807702  URESK                                          520                    1 70  173
BOGR 12SPCR  4CAHE  1BUDA  1AGSM  10PPO 10                                         0 70  173
5211  2807702  URESK                                          520                    1 70  174
BOGR 10SPCR  20PPO  9                                                              0 70  174
5211  2807703  URESK                                          520                    1 70  175
BOGR  7SPCR  10PPO 15ENDO  1                                                       0 70  175
5211  2807703  URESK                                          520                    1 70  176
BOGR  5SPCR  10PPO 16                                                              0 70  176
5211  2807703  URESK                                          520                    1 70  177
BOGR  7CAHE  10PPO 14SPCO  1                                                       0 70  177
5211  2807703  URESK                                          520                    1 70  178
BOGR  5SPCR  20PPO 15PACH  2                                                       0 70  178
5211  2807703  URESK                                          520                    1 70  179
BOGR  60PPO 18PACH  2                                                              0 70  179
5211  2807704  URESK                                          520                    1 70  180
BOGR  7BUDA  1SPCR  3ARLO  10PPO 15                                                0 70  180
5211  2807704  URESK                                          520                    1 70  181
BOGR  8SPCR  20PPO 12ARTH  1                                                       0 70  181
5211  2807704  URESK                                          520                    1 70  182
BOGR 13CAHE  20PPO 11                                                              0 70  182
5211  2807704  URESK                                          520                    1 70  183
BOGR  6SPCR  4ARLO  20PPO 12PACH  1                                                0 70  183
5211  2807704  URESK                                          520                    1 70  184
BOGR 15ARLO  10PPO  6MOSS  1                                                       0 70  184
5211  2807705  URESK                                          520                    1 70  185
BOGR 12CAHE  1SPCR  10PPO  3ARFR  2ARTH  1                                         0 70  185
5211  2807705  URESK                                          520                    1 70  186
BOGR 10ARLO  2SPCR  2SCPA  1CAHE  10PPO  6ARFR  2SPCO  1PACH  10                   0 70  186
5211  2807705  URESK                                          520                    1 70  187
BOGR 13ARLO  2SPCR  30PPO  5ARFR  2SPCO  1                                         0 70  187
5211  2807705  URESK                                          520                    1 70  188
BOGR 12CAHE  1SPCR  3BUDA  1ARLO  10PPO  3ARFR  3SPCO  1PACH  10                   0 70  188
5211  2807705  URESK                                          520                    1 70  189
BOGR 10SPCR  1AGSM  1CAHE  10PPO  9ARFR  5                                         0 70  189
5211  2807706  URESK                                          520                    1 70  190
BOGR 16SPCR  3CAHE  3ARLO  20PPO  60ECO  1PACH  4                                  0 70  190
5211  2807706  URESK                                          520                    1 70  191
BOGR  7SPCR  4ARLO  40PPO  8                                                       0 70  191
5211  2807706  URESK                                          520                    1 70  192
BOGR 11SPCR  2CAHE  1ARLO  10PPO  90ECO  1PACH  2                                 0 70  192
5211  2807706  URESK                                          520                    1 70  193
BOGR 10SPCR  4CAHE  2ARLO  10PPO  9PACH  2ARTH  1                                 0 70  193
5211  2807706  URESK                                          520                    1 70  194
BOGR 10CAHE  2ARLO  40PPO  5ARFR  1PACH  1                                         0 70  194
5211  2807707  URESK                                          520                    1 70  195
BOGR 12CAHE  1AGSM  1SPCR  1EREF  20PPO  6ARFR  1                                 0 70  195
5211  2807707  URESK                                          520                    1 70  196
BOGR 11ARLO  2SPCR  20PPO  6ARFR  2                                               0 70  196
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5211  2807707  URESK                                          520                    1 70  197
BOGR 16SPCR  1CAHE  10PPO  6EREF  2PACH  1                                          0 70  197
5211  2807707  URESK                                          520                    1 70  198
BOGR 12CAHE  1SPCR  30PPO  7EREF  4                                                0 70  198
5211  2807707  URESK                                          520                    1 70  199
BOGR 11SPCR  5AGSM  10PPO  3EREF  4SPCO  1ARTH  1                                  0 70  199
5211  2807708  URESK                                          520                    1 70  200
BOGR 15CAHE  1SPCR  30PPO 12ARFR  2                                               0 70  200
5211  2807708  URESK                                          520                    1 70  201
BOGR 16SPCR  3AGSM  10PPO  7                                                      0 70  201
5211  2807708  URESK                                          520                    1 70  202
BOGR 15ARLO  1BUDA  1AGSM  1CAHE  20PPO  6ARFR  1PACH  2                          0 70  202
5211  2807708  URESK                                          520                    1 70  203
BOGR 14AGSM  2CAHE  2SPCR  30PPO  7ARFR  1ARTH  1                                  0 70  203
5211  2807708  URESK                                          520                    1 70  204
BOGR 11AGSM  1SPCR  3ARLO  10PPO  7ARFR  2SPCO  1PACH  1                          0 70  204
98
5211  1108701  URESK                                          520                    2 70  205
BOGR 15ARLO  2SPCR  4BUDA  1CAHE  10PPO  6ARFR  40ECO  4PACH                     31 70  205
SPCO  1                                                                           0 70  205
5211  1108701  URESK                                          520                    2 70  206
BOGR 13SPCR  4AGSM  2ARLO  2STCO  3CAHE  4BUDA  10PPO  50ECO                     11 70  206
SPCO  2PACH  3ARTH  1ARFR  1                                                      0 70  206
5211  1108701  URESK                                          520                    2 70  207
BOGR 18ARLO  1SPCR  2CAHE  1STCO  10PPO  70ECO  1ARFR  2CHNA                     11 70  207
PACH  7SPCO  1                                                                    0 70  207
5211  1108701  URESK                                          520                    1 70  208
BOGR 19SPCR  6ARLO  10PPO  5ARFR  2PACH  1ARTH  1                                 0 70  208
5211  1108701  URESK                                          520                    2 70  209
BOGR 14SPCR  6ARLO  1CAHE  3STCO  20PPO  30ECO  1SPCO  1ARFR                     11 70  209
PACH  2ARTH  1                                                                    0 70  209
5211  1108702  URESK                                          520                    1 70  210
BOGR 14SPCR  2ARLO  10PPO 10ARFR  2                                               0 70  210
5211  1108702  URESK                                          520                    1 70  211
BOGR 15SPCR  3ARLO  10PPO  6SPCO  3PACH  1KOSC  10ECO  1                          0 70  211
5211  1108702  URESK                                          520                    1 70  212
BOGR  9SPCR  3CAHE  1BUDA  20PPO  9SPCO  3PACH  1                                 0 70  212
5211  1108702  URESK                                          520                    1 70  213
BOGR 12SPCR  3CAHE  1BUDA  3STCO  10PPO  7ARFR  1SPCO  20ECO                     10 70  213
5211  1108702  URESK                                          520                    1 70  214
BOGR  8SPCR  3ARLO  2BUDA  20PPO  7ASTR  1                                       0 70  214
5211  1108703  URESK                                          520                    1 70  215
SPCR  2BOGR 10ARLO  3CAHE  20PPO  7SPCO  4PACH  1                                0 70  215
5211  1108703  URESK                                          520                    1 70  216
BOGR 14SPCR  20PPO 11SPCO  1                                                      0 70  216
5211  1108703  URESK                                          520                    1 70  217
BOGR 11SPCR  4ARLO  20PPO 11SPCO  2ARFR  1SEED  1                                 0 70  217
5211  1108703  URESK                                          520                    1 70  218
BOGR  8SPCR  1ARLO  2BUDA  10PPO 10SPCO  2                                        0 70  218
5211  1108703  URESK                                          520                    1 70  219
BOGR 16SPCR  1ARLO  1CAHE  10PPO  7PACH  2                                        0 70  219
5211  1108704  URESK                                          520                    1 70  220
BOGR  9ARLO  5SPCR  6CAHE  1AGSM  10PPO  2SPCO  1ARFR  4                         0 70  220
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5211   1108704  URESK                                          520                              1 70  221
BOGR 13ARLO  2SPCR  4CAHE   1STCO   10PPO   2ARFR   1                                           0 70  221
5211   1108704  URESK                                          520                              1 70  222
BOGR 15ARLO  3SPCR  10PPO   3SPCO   4ARFR   2                                                   0 70  222
5211   1108704  URESK                                          520                              1 70  223
BOGR 10ARLO  2SPCR  3CAHE   1AGSM   1STCO   1SPCO   1ARFR   3                                   0 70  223
5211   1108704  URESK                                          520                              2 70  224
BOGR 11ARLO  5SPCR  2CAHE   1AGSM   20PPO   2SPCO   2ARFR   3LIIN                              11 70  224
ENDO   1                                                                                        0 70  224
5211   1108705  URESK                                          520                              1 70  225
BOGR 13SPCR  4CAHE  10PPO  13ARFR   1CHNA   1SPCO   2PACH   1ARTH                              10 70  225
5211   1108705  URESK                                          520                              1 70  226
BOGR  9CAHE  1ARLO  20PPO   7ARFR   3POAV   1                                                   0 70  226
5211   1108705  URESK                                          520                              1 70  227
BOGR  8SPCR  4CAHE  1ARLO   10PPO   7ARFR   3SPCO   1POAV   1PACH                              20 70  227
5211   1108705  URESK                                          520                              1 70  228
BOGR  8SPCR  8ARLO  10PPO   6ARFR   2SPCO   3PACH   1ARTH   1                                   0 70  228
5211   1108705  URESK                                          520                              1 70  229
BOGR  8SPCR  4CAHE  1ARLO   20PPO  10ARFR   1SPCO   2                                           0 70  229
5211   1108706  URESK                                          520                              1 70  230
BOGR  7SPCR  4AGSM  1STCO   10PPO  10CHNA   2SPCO   2                                           0 70  230
5211   1108706  URESK                                          520                              1 70  231
BOGR 12SPCR  3CAHE  1SCPA   10PPO   9SPCO   2ARFR   1                                           0 70  231
5211   1108706  URESK                                          520                              1 70  232
BOGR 13SPCR  3CAHE  10PPO  10SPCO   1                                                           0 70  232
5211   1108706  URESK                                          520                              1 70  233
BOGR 10SPCR  20PPO 16CHNA   1                                                                   0 70  233
5211   1108706  URESK                                          520                              1 70  234
BOGR 10SPCR  1AGSM  10PPO  11ARFR   1PACH   1                                                   0 70  234
5211   1108707  URESK                                          520                              1 70  235
BOGR 15CAHE  1AGSM  10PPO  11ARFR   1SPCO   2PACH   1                                           0 70  235
5211   1108707  URESK                                          520                              1 70  236
BOGR 10AGSM  1ARLO  20PPO  11SPCO   1PACH   1                                                   0 70  236
5211   1108707  URESK                                          520                              1 70  237
BOGR  8AGSM  2ARLO  1SPCR   20PPO  10ARFR   1SPCO   2EREF   1                                   0 70  237
5211   1108707  URESK                                          520                              1 70  238
BOGR 11CAHE  1ARLO  1SPCR   20PPO  10ARFR   2SPCO   1PACH   2                                   0 70  238
5211   1108707  URESK                                          520                              1 70  239
BOGR  7CAHE  1SPCR  30PPO  12ARFR   2PACH   1                                                   0 70  239
5211   1108708  URESK                                          520                              1 70  240
AGSM  1SPCR  5CAHE  2BOGR  11STCO   10PPO   7PACH   3                                           0 70  240
5211   1108708  URESK                                          520                              1 70  241
SPCR  1CAHE  1BOGR 15STCO   1MUTO   1ARLO   10PPO   3SPCO   1                                   0 70  241
5211   1108708  URESK                                          520                              1 70  242
AGSM  2SPCR  4CAHE  3BOGR  120PPO   50ECO   1                                                   0 70  242
5211   1108708  URESK                                          520                              1 70  243
SPCR  4CAHE  4BOGR 11ARLO   20PPO   1SPCO   20ECO   1                                           0 70  243
5211   1108708  URESK                                          520                              1 70  244
SPCR  5CAHE  1BOGR 12BUDA   20PPO   3SPCO   1ARFR   1                                           0 70  244
98
5211   2508701  URESK                                          520                              1 70  245
BOGR 14AGCR  2SPCR  10PPO   3                                                                   0 70  245
5211   2508701  URESK                                          520                              1 70  246
BOGR 13STCO  2SPCR  2FEOC   20PPO   3                                                           0 70  246
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5211  2508701  URESK                                                                    1 70  247
BOGR 17FEOC  10PPO  3SPCO  1SEED  1                    520                              0 70  247
5211  2508701  URESK                                                                    1 70  248
BOGR 11CAHE  1FEOC  2ARLO  1SPCR  20PPO  5SPCO  1     520                              0 70  248
5211  2508701  URESK                                                                    1 70  249
FEOC  2BOGR 15CAHE  1ARLO  10PPO  2                    520                              0 70  249
5211  2508702  URESK                                                                    1 70  250
BOGR 11FEOC  10PPO  7ARFR  3                          520                              0 70  250
5211  2508702  URESK                                                                    1 70  251
ARLO  1BOGR  3CAHE  1AGSM  20PPO 10ARFR  3            520                              0 70  251
5211  2508702  URESK                                                                    1 70  252
BOGR  8ARLO  1AGSM  3CAHE  1ARFR  20PPO  9            520                              0 70  252
5211  2508702  URESK                                                                    1 70  253
BOGR  8ARLO  2AGSM  10PPO  9SPCO  1ARFR  2           520                              0 70  253
5211  2508702  URESK                                                                    1 70  254
BOGR  6ARLO  3CAHE  10PPO  9ARFR  3SPCO  2           520                              0 70  254
5211  2508703  URESK                                                                    1 70  255
BOGR  40PPO 17                                        520                              0 70  255
5211  2508703  URESK                                                                    1 70  256
BOGR  3CAHE  10PPO 18                                 520                              0 70  256
5211  2508703  URESK                                                                    1 70  257
BOGR  5CAHE  1AGCR  10PPO 13                          520                              0 70  257
5211  2508703  URESK                                                                    1 70  258
BOGR  80PPO 15                                        520                              0 70  258
5211  2508703  URESK                                                                    1 70  259
BOGR  8ARLO  1SPCR  10PPO 14                          520                              0 70  259
5211  2508704  URESK                                                                    1 70  260
BOGR 16CAHE  5STCO  2ARLO  4SPCR  20PPO  9ARFR  4SPCO  2PSTE                           10 70  260
5211  2508704  URESK                                                                    2 70  261
BOGR 12CAHE  7STCO  4ARLO  6SPCR  6BUDA  10PPO  6ARFR  2SPCO                          11 70  261
MOSS  1KOSC  1                                        520                              0 70  261
5211  2508704  URESK                                                                    2 70  262
BOGR 12ARLO  3CAHE  7SPCR  4AGSM  2STCO  10PPO 11PSTE  1SPCO                          41 70  262
ARFR  6ARTH  1CHNA  1                                 520                              0 70  262
5211  2508704  URESK                                                                    2 70  263
BOGR 13CAHE  8AGSM  1ARLO  4SPCR  10PPO 10KOSC  1SPCO  3ARFR                          71 70  263
PSTE  1MOSS  2                                        520                              0 70  263
5211  2508704  URESK                                                                    2 70  264
BOGR 13CAHE  4ARLO  3SPCR  4STCO  10PPO  6ARFR  7PSTE  1ARTH                          11 70  264
MOSS  2SPCO  2                                        520                              0 70  264
5211  2508705  URESK                                                                    1 70  265
SPCR  4BOGR  9AGSM  3CAHE  2ARLO  2ARFR  80PPO  4CHNA  1EVNU                          10 70  265
5211  2508705  URESK                                                                    2 70  266
BOGR 14SPCR  3ARLO  1AGSM  20PPO  3SPCO  1ARFR  6CHNA  1EVNU                          11 70  266
PECA  1                                               520                              0 70  266
5211  2508705  URESK                                                                    1 70  267
BOGR 16CAHE  5AGSM  2ARLO  2ARFR  5SPCO  1PSTE  1                                     0 70  267
5211  2508705  URESK                                                                    2 70  268
BOGR 17AGSM  1ARLO  1SPCR  1EVNU  2ARFR  7PACH  1SPCO  20PPO                          11 70  268
PSTE  1                                               520                              0 70  268
5211  2508705  URESK                                                                    2 70  269
BOGR 14AGSM  4SPCR  3ARFR  8PACH  1EVNU  1SPCO  2PSTE  1KOSC                          11 70  269
OPPO  1                                               520                              0 70  269
5211  2508706  URESK                                                                    1 70  270
BOGR 16SPCR  4CAHE  10PPO  5SPCO  1                                                    0 70  270
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5211  2508706  URESK                                    520                    1  70  271
BOGR 18SPCR  3STCO  1CAHE  2ARLO  10PPO  4ARFR  2PACH  1                      0  70  271
5211  2508706  URESK                                    520                    1  70  272
BOGR 17SPCR  6ARLO  1STCO  30PPO  4ARFR  2PACH  2MOSS  1                      0  70  272
5211  2508706  URESK                                    520                    1  70  273
BOGR 17SPCR  5CAHE  3STCO  3AGSM  10PPO  5SPCO  1PACH  1                      0  70  273
5211  2508706  URESK                                    520                    1  70  274
BOGR 18SPCR  3CAHE  10PPO  5SPCO  2ARFR  2PACH  1                             0  70  274
5211  2508707  URESK                                    520                    1  70  275
BOGR 12SPCR  3CAHE  10PPO  6                                                   0  70  275
5211  2508707  URESK                                    520                    1  70  276
AGSM  5BOGR  8SPCR  3CAHE  10PPO 10ARFR  2                                     0  70  276
5211  2508707  URESK                                    520                    1  70  277
BOGR 11SPCR  3AGSM  3CAHE  10PPO 10EREF  1PACH  1                             0  70  277
5211  2508707  URESK                                    520                    1  70  278
BOGR 12SPCR  1CAHE  9AGSM  20PPO  8ARFR  2MOSS  1                             0  70  278
5211  2508707  URESK                                    520                    1  70  279
BOGR  6CAHE  4SPCR  5AGSM  1ARLO  1CHNA  10PPO  8ARFR  3PACH                  10  70  279
5211  2508708  URESK                                    520                    1  70  280
AGSM  8ARLO  1STCO  1BOGR 14SPCR  1CAHE  20PPO  4                             0  70  280
5211  2508708  URESK                                    520                    1  70  281
BOGR 13SPCR  2CAHE  2ARLO  10PPO  7CHAL  1ENDO  1PACH  1                      0  70  281
5211  2508708  URESK                                    520                    1  70  282
BOGR 15STCO  1AGSM  4SPCR  1ARLO  20PPO  6ARFR  1ARTH  1CHAL                  10  70  282
5211  2508708  URESK                                    520                    1  70  283
CAHE  3BOGR 14AGSM  3SPCR  20PPO  2ARFR  2CHNA  1                             0  70  283
5211  2508708  URESK                                    520                    1  70  284
BOGR 13ARLO  1AGSM  3CAHE  5SPCO  20PPO  5                                     0  70  284
98
5211  0809701  URESK                                    520                    1  70  285
BOGR 11AGSM  2SPCR  1ARLO  20PPO  2SPCO  1PACH  3ARFR  1ENDO                  10  70  285
5211  0809701  URESK                                    520                    1  70  286
BOGR 13AGSM  2STCO  1CAHE  3SPCR  10PPO  2ARFR  1PACH  1                      0  70  286
5211  0809701  URESK                                    520                    1  70  287
BOGR 14AGSM  2CAHE  5FEOC  1BUDA  10PPO  4PACH  2ENDO  1                      0  70  287
5211  0809701  URESK                                    520                    1  70  288
BOGR 11CAHE  2SPCR  4AGSM  10PPO  1SPCO  2PACH  2                             0  70  288
5211  0809701  URESK                                    520                    1  70  289
BOGR 13SPCR  3AGSM  2CAHE  40PPO  2                                           0  70  289
5211  0809702  URESK                                    520                    1  70  290
BOGR  5SPCR  2FEOC  1AGSM  1BUDA  1CAHE  30PPO 11SPCO  1PACH                  10  70  290
5211  0809702  URESK                                    520                    1  70  291
BOGR  8SPCR  3AGSM  4CAHE  2BUDA  10PPO  6PACH  1                             0  70  291
5211  0809702  URESK                                    520                    1  70  292
BOGR 11SPCR  4AGSM  2ARLO  1CAHE  20PPO  7SPCO  1MUDI  1PSTE                 10  70  292
5211  0809702  URESK                                    520                    1  70  293
BOGR 10FEOC  1SPCR  20PPO 12ASTR  2                                           0  70  293
5211  0809702  URESK                                    520                    1  70  294
BOGR 12ARLO  20PPO  7SPCO  1PSTE  1                                           0  70  294
5211  0809705  URESK                                    520                    1  70  295
BOGR 140PPO 10                                                                0  70  295
5211  0809703  URESK                                    520                    1  70  296
BOGR 11STCO  1SPCR  30PPO 10PACH  1                                           0  70  296
5211  0809703  URESK                                    520                    1  70  297
BOGR 10SPCR  4CAHE  10PPO  9MOSS  1                                           0  70  297
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5211  0809703  URESK                                    520                    1 70  298
BOGR  8SPCR  2BUDA  1CAHE  10PPO 13                                            0 70  298
5211  0809703  URESK                                    520                    1 70  299
BOGR 11SPCR  1AGSM  10PPO 10SPCO  1                                          0 70  299
5211  0809704  URESK                                    520                    2 70  300
BOGR 14CAHE  3STCO  1SPCR  3ARLO  4AGSM  1ARFR  20ECO  1MOSS  11 70  300
ASTR  10PPO  2SPCO  1                                                        0 70  300
5211  0809704  URESK                                    520                    1 70  301
BOGR 13AGSM  3CAHE  1STCO  1SPCO  40PPO  2ARFR  1                          0 70  301
5211  0809704  URESK                                    520                    2 70  302
BOGR 11ARLO  4CAHE  1STCO  1SPCR  1ARFR  1EREF  2SPCO  30PPO  51 70  302
OECO  1                                                                      0 70  302
5211  0809704  URESK                                    520                    2 70  303
BOGR  8CAHE  3SPCR  2ARLO  3EREF  10PPO  5ARFR  2PACH  1SPCO  21 70  303
KOSC  1                                                                      0 70  303
5211  0809704  URESK                                    520                    1 70  304
BOGR 10STCO  2AGSM  2ARLO  1SPCR  3SPCO  1ARFR  2EREF  10PPO  30 70  304
5211  0809705  URESK                                    520                    1 70  305
BOGR 13SPCR  4ARLO  2CAHE  1ARFR  20PPO  60ECO  1                          0 70  305
5211  0809705  URESK                                    520                    1 70  306
BOGR 13AGSM  10PPO  5ARFR  1SPCO  1                                         0 70  306
5211  0809705  URESK                                    520                    1 70  307
BOGR 10ARLO  4CAHE  10PPO 10ARFR  3SPCO  1                                  0 70  307
5211  0809705  URESK                                    520                    1 70  308
BOGR  8SPCR  4CAHE  1ARLO  10PPO  5ARFR  2SPCO  1                          0 70  308
5211  0809705  URESK                                    520                    1 70  309
BOGR 10CAHE  2ARLO  10PPO  7ARFR  3                                         0 70  309
5211  0809706  URESK                                    520                    1 70  310
BOGR 14SPCR  2CAHE  3ARLO  10PPO  7SPCO  1PACH  3ENDO  1                   0 70  310
5211  0809706  URESK                                    520                    1 70  311
BOGR 14ARLO  1SPCR  2CAHE  20PPO  4ARFR  1                                  0 70  311
5211  0809706  URESK                                    520                    1 70  312
BOGR 13SPCR  5AGSM  2CAHE  10PPO  4ARFR  1                                  0 70  312
5211  0809706  URESK                                    520                    1 70  313
BOGR 14SPCR  2AGSM  30PPO  2SPCO  2                                         0 70  313
5211  0809706  URESK                                    520                    1 70  314
BOGR 14AGSM  4ARLO  10PPO  6PACH  2                                         0 70  314
5211  0809707  URESK                                    520                    2 70  315
BOGR 11AGSM  2CAHE  5SPCR  6STCO  20PPO  3ARFR  3KOSC  1ENDO  11 70  315
ARTH  2                                                                      0 70  315
5211  0809707  URESK                                    520                    2 70  316
BOGR 12SPCR  5ARLO  2CAHE  5STCO  2FEOC  10PPO  6ARFR  3KOSC  11 70  316
MOSS  1                                                                      0 70  316
5211  0809707  URESK                                    520                    2 70  317
BOGR 14CAHE  3STCO  4ARLO  3SPCR  3AGSM  10PPO  8ARFR  5MOSS  11 70  317
PACH  1ARTH  2                                                               0 70  317
5211  0809707  URESK                                    520                    2 70  318
BOGR 15CAHE  3STCO  2SPCR  5ARLO  20PPO  4ARFR  2KOSC  1SPCR  11 70  318
MOSS  2ARTH  10ECO  1                                                        0 70  318
5211  0809707  URESK                                    520                    1 70  319
BOGR 15CAHE  3SPCR  6ARLO  1STCO  20PPO  7ARFR  3                          0 70  319
5211  0809708  URESK                                    520                    2 70  320
BOGR 12SPCR  6CAHE  3ARLO  3AGSM  2STCO  10PPO  8KOSC  2BAOP  11 70  320
ARFR  2                                                                      0 70  320
5211  0809708  URESK                                    520                    1 70  320
BOGR 16ARLO  2SPCR  6STCO  20PPO  6KOSC  2LIIN  1ARFR  3ARTH  10 70  320
5211  0809708  URESK                                    520                    1 70  320
BOGR 15ARLO  2SPCR  5CAHE  10PPO  6ARLO  5KOSC  1                          0 70  320
5211  0809708  URESK                                    520                    1 70  320
BOGR 16AGSM  1CAHE  3SPCR  40PPO  4ARFR  6EVNU  1KOSC  1ARTH  20 70  320
5211  0809708  URESK                                    520                    1 70  320
BOGR 16CAHE  4ARLO  1SPCR  20PPO 11ARFR  2KOSC  2                          0 70  320
99
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APPENDIX B

The belowground herbage data is Grassland Biome data set number A2U005B. A list of raw data for calculations of root biomass are given for 22 sampling periods (1969-1970). Root biomass ($g/m^2/cm$) is presented in tabular form for the above periods. Crown biomass for the 1969 summer sampling period is also listed in tabular form.

EXPLANATION OF DATA SHEETS USED FOR 1969-1970

Number 1

Columns	Heading	Description
1 - 6	Batch	Date: Year, month, day
7	Code	Number of data sheet (1)
9 - 12	Carton number	Number of sample as assigned in field
14 - 17	Crucible number	Number of crucible in which the sample is placed for ashing
19 - 26	Crucible weight plus sample	Weight of sample plus crucible before ashing

Number 2

Columns	Heading	Description
1 - 6	Batch	Date: Year, month, day
7	Code	Number of data sheet (2)
14 - 17	Crucible number	Number of crucible in which the sample is placed
19 - 26	Crucible weight plus ashed weight	Weight of sample plus crucible after ashing

Number 3

Columns	Heading	Description
1 - 6	Batch	Date: Year, month, day
7	Code	Number of data sheet (3)
9 - 12	Carton number	Number of sample assigned in field
28 - 30	Study area	Identifying information to distinguish the different study sites
32 - 37	Date	Year, month, day
39 - 40	Watershed	Study plot or treatment of replicate number
42 - 44	Plot number	Number of plot sampled
47	Core number	Number of cores taken per plot
50	Depth	Position of core signed in profile
52 - 54	Core diameter	Diameter of core in mm
56 - 58	Core thickness	Length of core segment in mm

ROOT BIOMASS CARD NUMBER TWO

BATCH						CODE	CRUCIBLE NUMBER				CRUCIBLE WEIGHT PLUS ASHED WEIGHT							
1	2	3	4	5	6	7	14	15	16	17	18	20	21	22	23	24	25	26
A	U	T	O	D	UP	AUTO DUP												

ROOT BIOMASS CARD NUMBER THREE

BATCH						CODE	CARTON NUMBER				STUDY AREA			DATE						WATER-SHED		PLOT NUMBER			CORE	DUP	CORE DIAMETER			CORE THICKNESS		
1	2	3	4	5	6	7	8	9	10	11	12	28	29	30	32	33	34	35	36	37	39	40	42	43	44	47	50	51	52	53	56	57	58
A	U	T	O	DU	P	AUTO DUP						AU	TO DUP		A	U	T	O	DU	P													