RESPONSE OF SEEDED *CENCHRUS CILIARIS* TO DIFFERENT FREQUENCIES AND SEASONS OF CLIPPING INTENSITIES.

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ABSTRACT

A simulation grazing (clipping) study was carried out in 1984 in the established seeded *Cenchrus ciliaris*, an intercrop with *Eucalyptus camaldulensis*, at Jamrud, Peshawar. This study was laid out under split-split plot design and was maintained for 9 years (1984-92). Three clipping intensities (stubble heights) and 3 frequencies (clipping intervals) were tested in 4 different seasons namely; the spring (February-April), the summer (May-July), the fall (August-October) and the winter (November-January). The study showed that average forage production under control (no treatment) was highest of all the treatments. This indicated that seeded *Cenchrus ciliaris* is sensitive to repeated clippings. However, clippings at different intensities and frequencies in different seasons had variable results. Light fortnightly clippings in the spring gave the highest forage production of all other intensities and frequencies. Heavy monthly clippings in the summer yielded highest forage production while moderate 1/2 monthly clippings gave highest forage production in the Fall. In the winter season heavy clipping gave highest forage production of all other intensities and frequencies. Enough soil moisture during Spring and winter seasons had no positive effect on forage production, however, availability of sufficient soil moisture in the fall season had appreciable effect on forage production. The study based on the information has suggested cut and carry programme for seeded *Cenchrus ciliaris* under silvopastoral system or deferred rotation grazing plan with grazing in late fall to winter season in the Peshawar valley.

INTRODUCTION

Uncultivated patches interspersed among the village settlements and cultivated areas in Peshawar valley are suitable for livestock production. Mostly such areas are overgrazed and are degraded. Their soil are too infertile and prone to excessive soil erosion. Local vegetation in such patches is sparse and less palatable. Natural recovery through plant succession is possible but would take many decades to reach a stage where palatable native forage species become abundant. Seeding with nutritious and high yielding grass

species may convert these degraded lands to productive range quite economically in a 2-3 years period depending upon introduced species. However, proper management after species establishment is very important for their sustainability . Important factors include proper intensity, frequency and season of grazing.

Although many gras species may be well adapted to this area, *Cenchrus ciliaris* RM. No.269, an ecotype from India was selected for seeding one of the small patch located near Jamrud, Peshawar. This ecotype is high yielding and well adapted to Peshawar conditions (Noor, 1991). Seeding may increase the forage production 40 times more than unseeded area. This would cause an increase in the carrying capacity from 23 ha/animal unit(AU)/year to 0.5 ha/AU/year (Khan and Zarif, 1982).

This article describes the results of the clipping study of *Cenchrus ciliaris* under different intensities and frequencies in different seasons. Though actual grazing may have some what different response yet the management plans could be drawn based on the information of this clipping study.

MATERIAL AND METHODS

Site Description

Experimental site is located near Jamrud, Peshawar about 5 km. west of Pakistan Forest Institute, Peshawar. It was an abandoned barani cultivated area under the control of Government. The area is utilized for Rifle shooting training: hence commonly called as "Target Area". In 1977 the area was afforested with *Eucalyptus camaldulensis* at 3x3 meter spacing by the Forest Department.

The area consists of alluvial fans and is moderately sloped from west to east having undulating topography. Soil is of alluvial in nature mostly containing coarse sand, gravel, silt and clay with different proportions. Soil is infertile and prone to excessive water erosion. It supports very sparse and less palatable forage species. Even planted *Eucalyptus camaldulensis* has poor growth and form.

Dry hot summer, cold winter and pleasant spring and fall seasons prevail in Peshawar. Rainfall is meager and scanty. Average rainfall over last 10 years (1984-93) was 401.0 mm. March is the wettest month(106.0 mm) followed by August (68.0 mm). June is the driest month(8.0 mm) followed by November (11.0 mm) (Table-1). Similarly seasonal rainfall distribution is quite variable. spring (February-April) on the average (over last 10 years) received highest rainfall (44% or 175.4 mm) of all the seasons. It is followed by fall (August- October) which received 24% or 97.7 mm. The lowest (14 percent or 57.6 mm) is received in summer (May-July). The winter season (November- January) gets 17 percent or 70.3 mm (Table 2).

Study Description

(i) Species Establishment

Cenchrus ciliaris was seeded over an area of 2 ha in July, 1980. Sowing was done in well prepared plots, ploughed twice across each other with tractor. Sowing was done manually in lines 50 cm apart at the rate of 10 kg/ha. between treelines. Species establishment was monitored annually through estimation of forage production. The species had established well. Forage production was at 3224 kg/ha, 2324 kg/ha and 3900 kg/ha for 1981, 1982, and 1983 respectively.

(ii) Clipping Study (Simulation Grazing Study)

This study was laid out in February, 1984 in the already seeded and established *Cenchrus ciliaris*. The study was laid out in split-split plot design. Four seasons were used as first split and 3 frequencies and 3 intensities were arranged in factorial rays as second split. Clipping treatments were 3 different intensities (Stubble height) namely; I_1 = 2.5 cm stubble height, I_2 = 5.0 cm stubble height and I_3 = 7.5 stubble height. Three frequencies were F_1 = 15 days interval, F_2 = 30 days interval, F_3 = 45 days interval. Four seasons were S_1 = spring (February-April), S_2 = summer (May-July), S_3 = fall (August-October) and S_4 = winter (November-January).

Sixteen blocks were randomly assigned to each season. Each block was sub divided in 10, one square meter, plots. The following Ten treatments were randomly assigned and were replicated 4 times.

T_1 F_1 I_1	Fortnightly clipping at 2.5 cm stubble height.
T_2 F_1 I_2	Fortnightly clipping at 5.0 cm stubble height.
T_3 F_1 I_3	Fortnightly clipping at 7.5 cm stubble height.
T_4 F_2 I_1	Monthly clipping at 2.5 cm stubble height.
T_5 F_2 I_2	Monthly clipping at 5.0 cm stubble height.
T_6 F_2 I_3	Monthly clipping at 7.5 cm stubble height.
T_7 F_3 I_1	One and half monthly clipping at 2.5 cm stubble height.
T_8 F_3 I_2	One and half monthly clipping at 5.0 cm stubble height.
T_9 F_3 I_3	One and half monthly clipping at 7.5 cm stubble height.
T_{10}	Control

(iii) Data Collection and Analysis

Seven clippings under F_1 each season scheduled for Ist. day and 16th day of each month were done. Similarly, 4 clippings under F_2 on Ist. day each month were made. Only 3 clippings on first day of first month and 3rd month and 16th day of 2nd month were done under F_3 in each season. However, in S_4 only Ist clipping (initial clipping) was done as regrowth did not occur on subsequent dates. Notwithstanding 1986 showed extraordinary regrowth even during December. Hence two more clippings were obtained in the said year. Initial clipping (first clipping) was done on Ist. day of

Figure 1

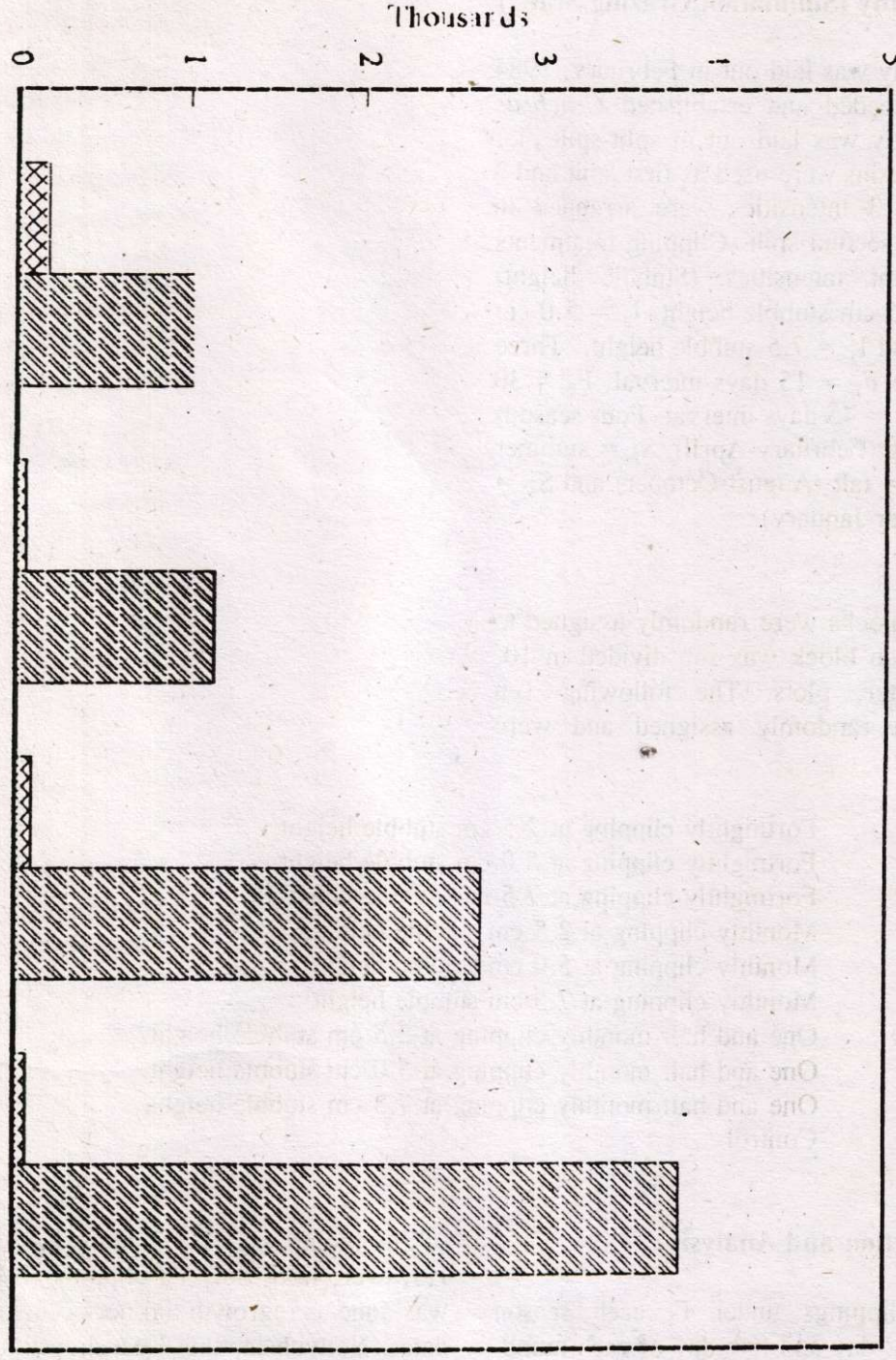


Fig. 1 Seasonal Average forage Production of C. Ciliaris for all intensities and frequencies at Target Area, Jamrud – Peshawar

Figure 2

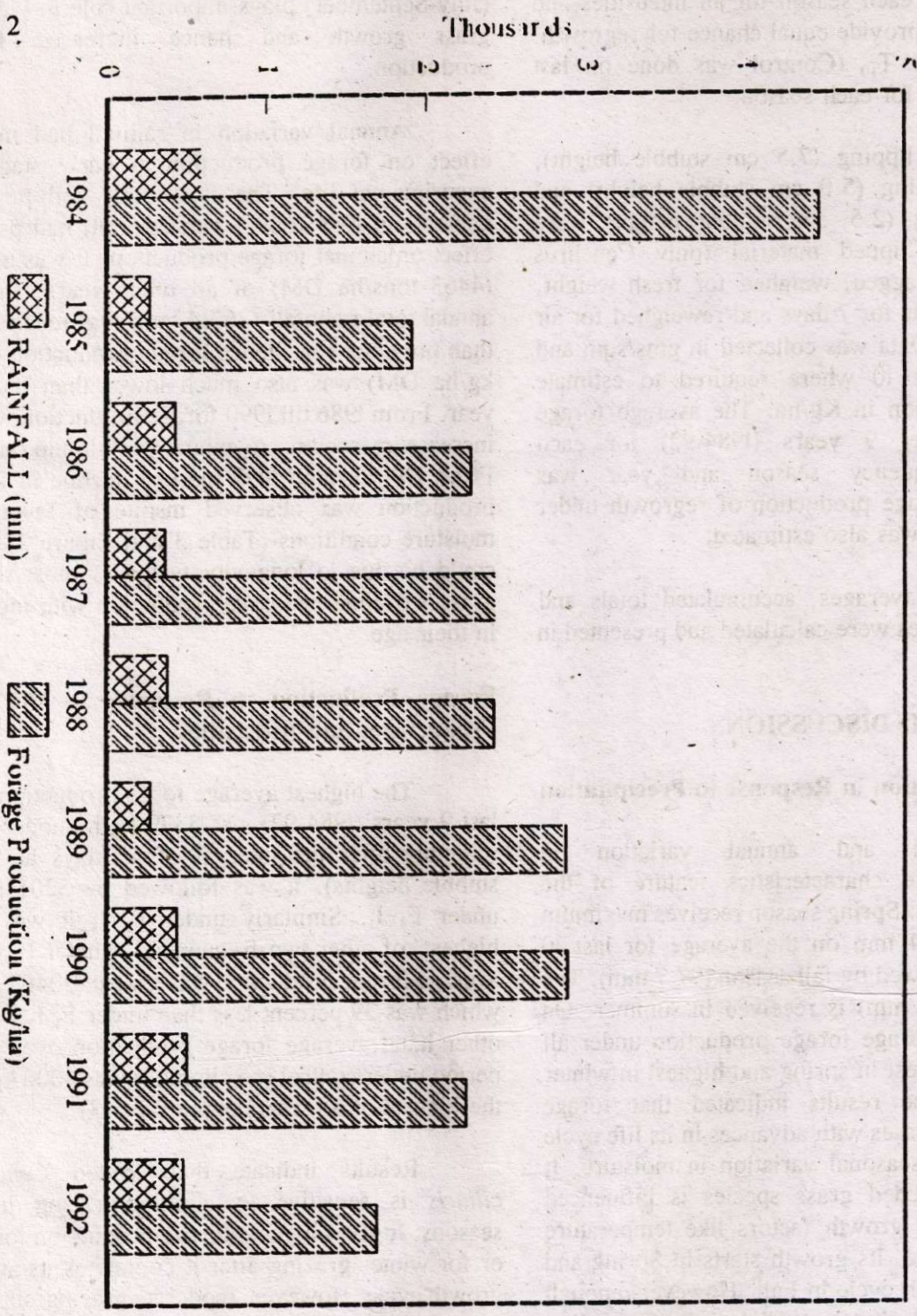


Fig 2. Average annual forage production of C. Ciliaris for all Intensities and frequencies at Target area, Jamrud Peshawar

each month in each season for all intensities and frequencies to provide equal chance for regrowth. Clipping under T_{10} (Control was done on last scheduled date for each season.

Light clipping (7.5 cm stubble height), moderate clipping (5.0 cm stubble height) and heavy clipping (2.5 cm stubble height) were carried out. Clipped material (only Cenchrus Ciliaris) was bagged, weighed for fresh weight, dried in open air for 7 days and reweighed for air dried weight. Data was collected in gms/sqm and multiplied with 10 where required to estimate forage production in Kg/ha. The average forage production over 9 years (1984-92) for each intensity, frequency season and year was calculated. Forage production of regrowth under each treatment was also estimated.

Simple averages, accumulated totals and percentage values were calculated and presented in tables.

RESULTS AND DISCUSSION

Forage Production in Response to Precipitation

Seasonal and annual variation in precipitation are characteristics feature of the Peshawar valley. Spring season receives maximum rainfall of 175.4 mm on the average for last 10 years. It is followed by fall season (97.7 mm). The minimum (57.0 mm) is received in summer. On the contrary average forage production under all treatment is lowest in spring and highest in winter (Figure 1). The results indicated that forage production increases with advances in its life cycle irrespective of seasonal variation in moisture. It appears that seeded grass species is influenced mostly by other growth factors like temperature and growth cycle. Its growth starts in Spring and completes growth cycle in Fall. However, enough soil moisture during potential growing period (July-September) plays important role in vigorous grass growth and hence increased forage production.

Annual variation in rainfall had marked effect on forage production at early stages of experimental life. The favourable soil moisture contents in 1984 (609.1 mm rainfall) had positive effect on annual forage production. It was highest (4463 tons/ha DM) of all other years. In 1985 annual total reainfall (267.4 mm) was much lower than previous year hence forage production (1915 kg/ha DM) was also much lower than the said year. From 1986 till 1990 forage production was on increase irrespective to annual variation in rainfall. From 1991 through 1992 marked decline in forage production was observed inspite of favourable moisture conditions (Table 3 and Figure 2). This could be due to longevity factor as most seeded grasses decline in forage production with increase in their age.

Forage Production in Response to Different Frequencies and Intensities

The highest average forge production over last 9 years (1984-92) was 3370 kg/ha under F_3 I_2 (clipping after the interval of 45 days at 5 cm stubble heights). It was followed by 3201 kg/ha under F_3 I_1. Similarly under F_3 I_3 it was also highest of other two frequencies. Under F_1 I_1 the average forage production was lowest (2046 kg/ha) which was 39 percent less than under F_3 I_2. On the other hand average forage production over same period under control (no clipping) was 4000 kg/ha, the highest of all treatments (Table 3).

Results indicate that seeded *Cenchrus ciliaris* is sensitive to clipping/grazing in all seasons. It gives highest forage production for hay or for winter grazing after it completes its annual growth cycle. However, moderate grazing/clipping intensity (5.0 cm stubble height) gives better

response if subjected to grazing/clipping programme at longer interval (45 days or more). However, for soil erosion control light intensity (7.5 cm stubble height) grazing/clipping is recommended. This intensity would give about 15 percent less production than moderate intensity at 45 days interval.

Forage Production in Response to Different Seasons

Cenchrus ciliaris , on the average,remains green for about 9 months. Depending on soil moisture contents it sprouts in early Spring and matures at the end of October. Data indicated that in 1988 regrowth after clipping occurred as late as mid December. This was exceptional response to better growing conditions. The height average forage production of 4315 kg/ha under I_1 was obtained in the winter season. It was followed by 3990 kg/ha in the fall seasons under I_2. The lowest 912 kg/ha was produced in the spring season under I_1. Frequencies and intensities have differential effects on forage production in each season. Light intensity and Fortnightly clipping gave highest forage production of all other frequencies and intensities in the spring season. In the summer season light intensity at monthly interval gave highest forage production. On the other hands moderate intensity at one and half monthly clipping gave highest forage production in the fall season (Table 4). This indicates that different intensities and frequencies had to be applied in different seasons for grazing the seeded rangelands of Target Area and other similar rangelands.

Forage Production in Response to Subsequent Clippings

Seven clippings under F_1, 4 clippings under F_2 and 3 clippings under F_3 were carried out in each season under each intensity (stubble height). Similarly, one clipping under control in each season was also done. Data indicates that in the Spring season Ist. and 2nd. clippings did not yield any forage as growth of *Cenchrus ciliaris* initiates after mid February. Hence the 3rd. clipping gave lowest yield of all other clippings in this season though stubble heights had different effect. From 4th through 7th clippings showed increase regrowth production. It increased from 28 kg/ha to 324 kg/ha under I_1. Other stubble heights had shown same trend in forage production (Table 5).

In the summer season Ist. clipping under all frequencies and intensities produced highest forage of all the clipping made afterwards. This response was due to the growth stage as clipping was done on Ist. May. Subsequent clippings showed decline in regrowth production. Fourth clipping, (done on 16th June, produced lowest forage under all stubble heights. This poor response was mostly due to high temperatures and low soil moisture contents in that period.

The fall season had shown variable somewhat different response to clippings. First clipping, as in the summer, had produced highest forage under all stubble heights. The second clipping done on 16th August produced lowest regrowth. Subsequently 3rd and 4th clippings showed increase in forage production and 5th and 6th clipping showed decline. Last clipping done on Ist November showed little increase over previous clippings. In the winter there were almost no regrowth after Ist. clipping done on Ist. November. However, in 1987 a very small regrowth was recorded during 2nd through 4th clippings (Table 5 and Figures 3 and 4).

CONCLUSION

Availability of sufficient soil moisture particularly during the fall season (August through October), which is potential growing period for summer grasses, the single most dominant factor

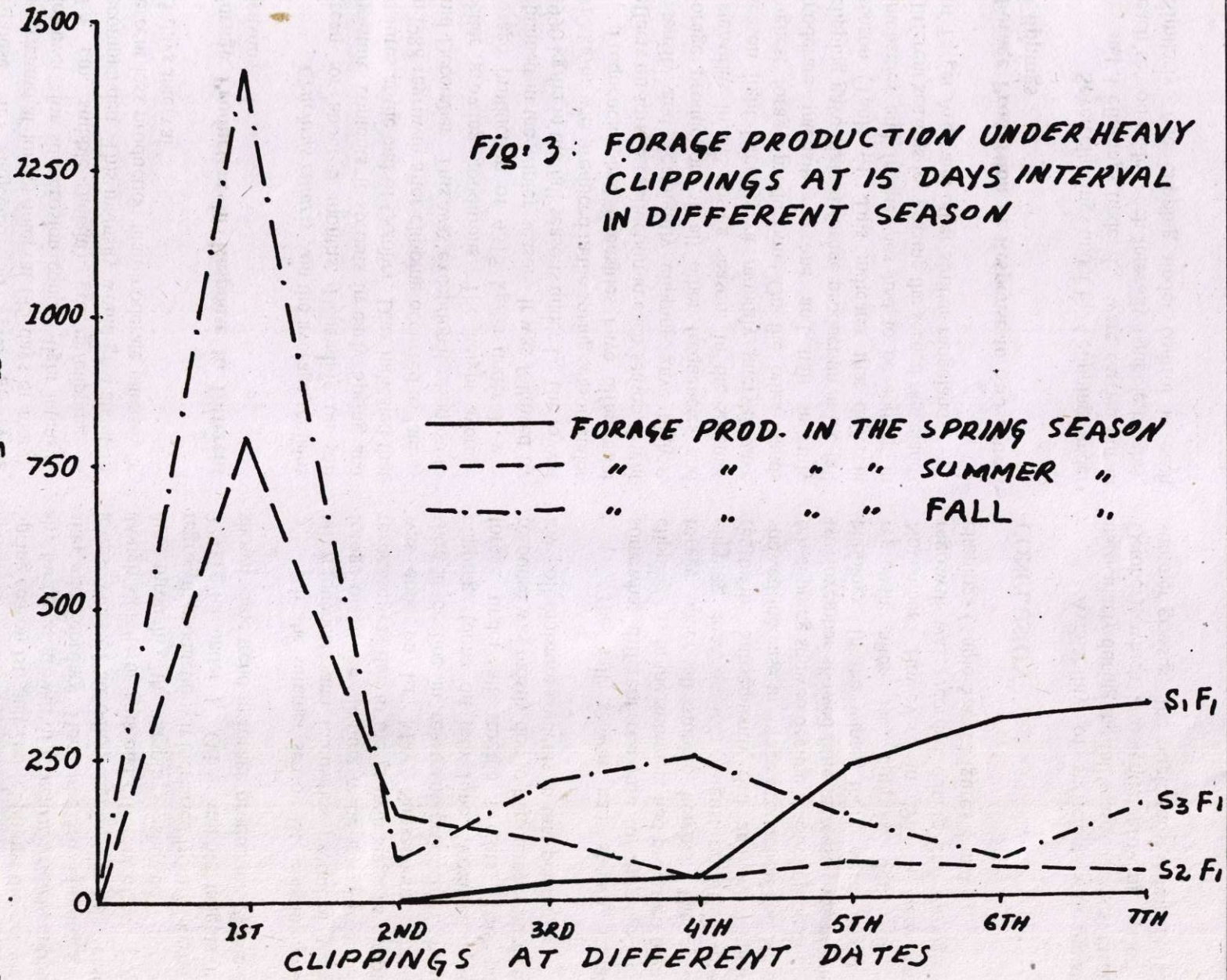
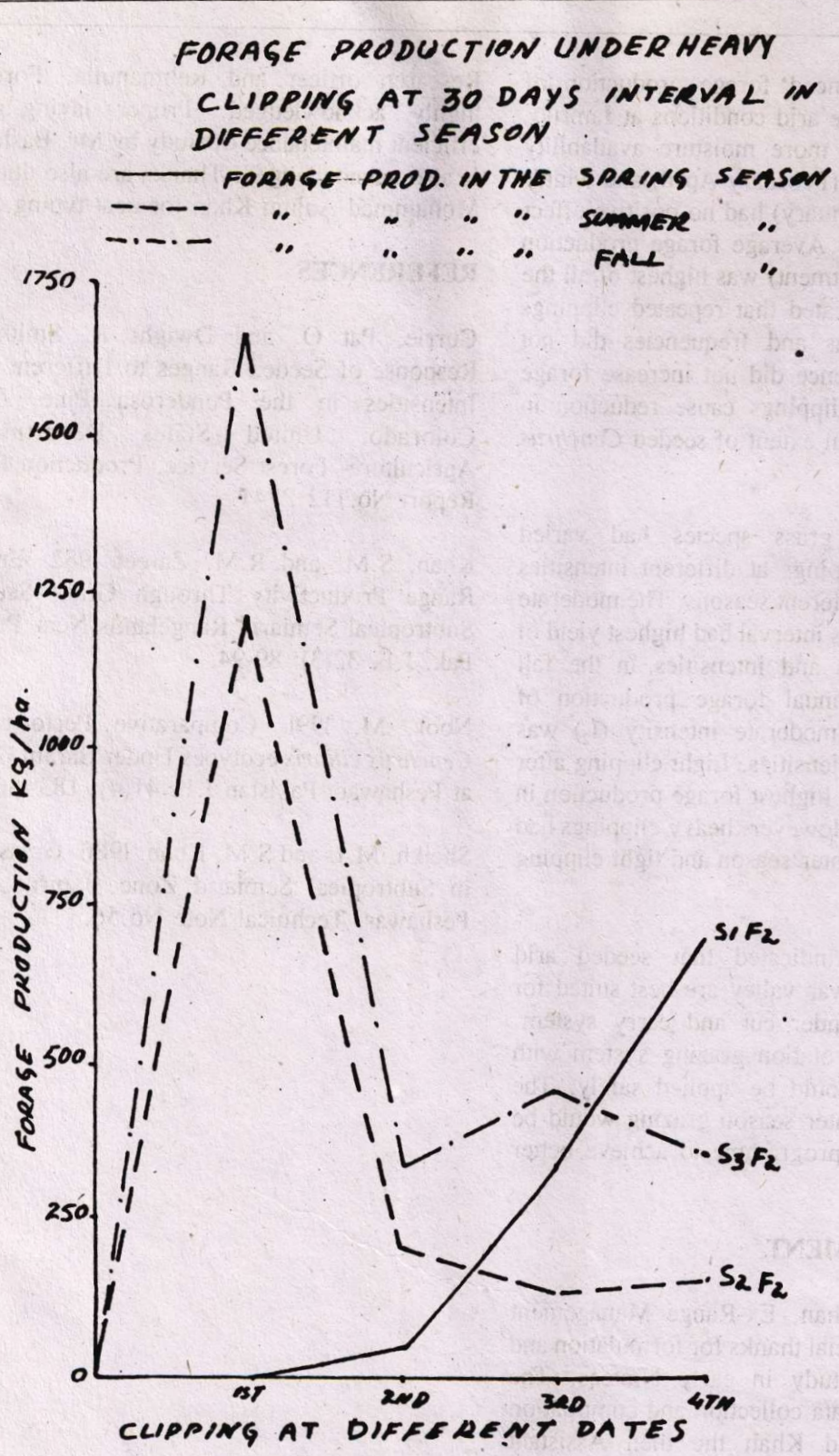


Fig: 3 : FORAGE PRODUCTION UNDER HEAVY CLIPPINGS AT 15 DAYS INTERVAL IN DIFFERENT SEASON
FORAGE PROD. IN THE SPRING SEASON
" " " " SUMMER "
" " " " FALL "
FORAGE PRODUCTION Kg/Ha.
1500
1250
1000
750
500
250
0
1ST
2ND
3RD
4TH
5TH
6TH
7TH
CLIPPINGS AT DIFFERENT DATES
S1 F1
S3 F1
S2 F1

Figure 3

Figure 4


FORAGE PRODUCTION UNDER HEAVY CLIPPING AT 30 DAYS INTERVAL IN DIFFERENT SEASON
FORAGE PROD. IN THE SPRING SEASON
" " " " SUMMER "
" " " " FALL "
1750
1500
1250
1000
750
500
250
0
FORAGE PRODUCTION KG/ha.
S1 F2
S3 F2
S2 F2
1ST
2ND
3RD
4TH
CLIPPING AT DIFFERENT DATES

responsible for enhanced forage production of seeded grass under the arid conditions at Jamrud, Peshawar. However, more moisture availability during Spring season (February-April) and winter season (November-January) had no positive effect on forage production. Average forage production under control (no treatment) was highest of all the treatments. This indicated that repeated clippings at different intensities and frequencies did not induce growth and hence did not increase forage production. Rather clippings cause reduction in plant vigour to certain extent of seeded *Cenchrus ciliaris*.

The seeded grass species had varied responses to the clippings at different intensities and frequencies in different seasons. The moderate clippings after 45 days interval had highest yield of all other frequencies and intensities in the fall season. Over all annual forage production of seeded grass under moderate intensity (I_2) was highest of all other intensities. Light clipping after 45 days interval gave highest forage production in the summer season. However, heavy clippings had yielded highest in winter season and light clipping in the spring season.

The results indicated that seeded arid rangelands of Peshawar valley are best suited for forage production under cut and carry system. However, deferred rotation grazing system with moderate intensity could be applied safely. The late fall and the Winter season grazing would be appropriate grazing programme to achieve better results.

ACKNOWLEDGEMENT

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Figure 5

Fig 5: FORAGE PRODUCTION UNDERHEAVY CLIPPING AT 45 DAYS INTERVAL IN DIFFERENT SEASON

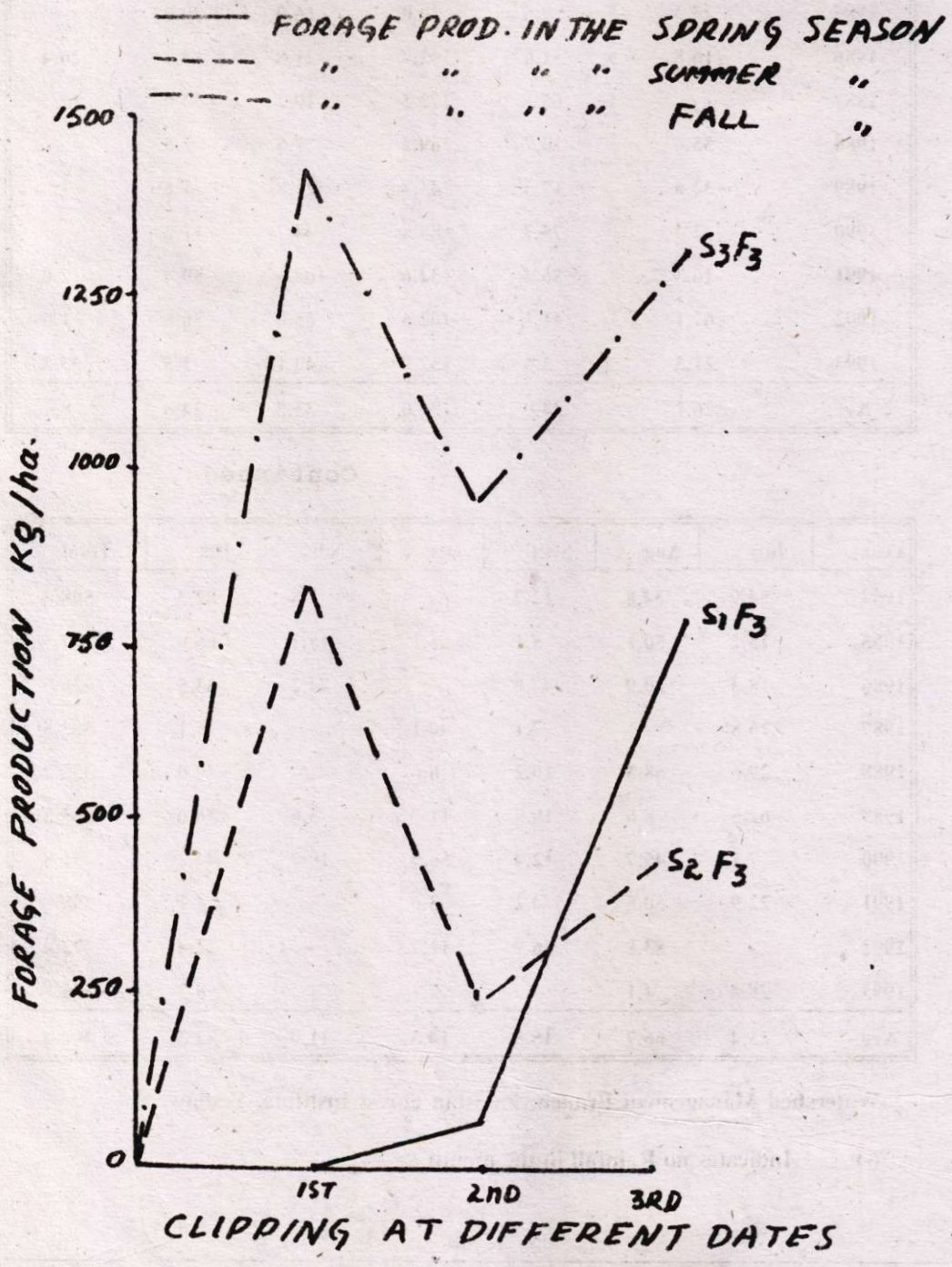

Table 1: RAINFALL DISTRIBUTION AT PAKISTAN FOREST INSTITUTE, PESHAWAR (1984-93) in (mm)

Year	Jan.	Feb.	March	April	May	June
1984	3.6	19.1	70.9	23.6	-	3.6
1985	25.3	7.6	30.0	16.0	29.0	-
1986	16.8	51.6	102.7	21.8	13.7	26.4
1987	-	65.5	172.5	10.2	32.0	14.2
1988	35.6	10.7	169.2	7.6	2.5	-
1989	32.6	17.3	43.7	21.8	7.6	-
1990	42.4	75.7	80.8	44.7	11.2	-
1991	16.3	56.4	134.6	104.6	89.4	2.0
1992	67.1	41.1	102.6	65.0	50.8	1.0
1993	21.3	3.6	152.9	40.1	3.5	33.5
Ave.	26.1	34.9	106.0	35.5	24.0	8.1

Continued

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1984	54.9	334.8	12.7	-	2.8	82.3	598.4
1985	15.2	50.1	5.1	5.1	18.1	66.0	267.5
1986	18.3	20.9	47.0	-	74.2	33.5	426.9
1987	16.8	-	7.1	40.1	-	5.1	363.5
1988	29.5	68.3	10.2	8.6	-	30.0	372.2
1989	62.5	8.6	19.8	11.7	3.6	36.6	265.8
1990	7.1	45.7	12.4	56.9	10.7	44.2	431.8
1991	22.9	50.5	14.2	3.6	-	4.1	498.8
1992	-	83.8	26.9	11.7	-	22.4	472.4
1993	28.4	4.1	-	7.1	-	8.3	302.8
Ave.	25.4	66.7	15.5	14.5	11.0	33.3	400.4

Source: Watershed Management Branch, Pakistan Forest Institute, Peshawr.

(-) Indicates no Rainfall in the month

Table 2: Seasonal Distribution of Rainfall at Pakistan Forest Institute, Peshawar.

(mm)

Year	SEASONS				Annual Total
	S_1	S_2	S_3	S_4	
	Feb.-April	May-July	Aug.-Oct.	Nov.-Jan.	
1984	113.6	58.4	347.5	88.7	598.4
1985	53.6	44.2	60.3	109.4	267.5
1986	176.1	58.4	68.1	124.5	426.9
1987	248.2	63.1	47.2	5.1	363.5
1988	187.5	31.5	87.1	65.6	372.2
1989	82.8	70.1	40.1	72.8	265.8
1990	201.2	18.3	115.0	97.3	431.8
1991	295.6	114.3	68.3	20.3	498.8
1992	208.7	51.8	122.4	89.5	472.4
1993	196.6	65.4	11.2	29.6	303.8
Ave.	176.4	57.5	97.7	70.4	409.4

Table 3: Average Annual Forage Production of seeded *Cenchrus ciliaris* at Different Intensities and Frequencies at Target Area Jamrud, Peshawar.

Kg/ha(DM)

Year	F_1			F_2			F_3			Average	Control
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3		
1984	1890	2270	1988	3258	3418	2810	7873	9455	7205	4463	1075
1985	1580	2015	2110	2195	2095	2095	1885	1790	147	1915	NA
1986	2713	2863	2575	2208	2065	2271	1825	2220	1748	2276	2475
1987	1601	2274	2238	2919	2507	2428	2559	2812	2584	2436	2750
1988	2546	2967	2636	2480	2344	2397	1913	2505	1993	2419	2913
1989	2856	3233	3681	3013	2635	2654	2688	2487	2608	2872	NA
1990	2317	2715	3165	2198	2373	2585	3903	3400	3320	2886	3060
1991	1743	1800	1783	1750	1538	1608	3490	3385	3170	2252	2800
1992	1173	1398	1168	1550	1383	1663	2675	2275	1830	1680	3250
Ave.	2046	2393	2371	2397	2262	2279	3201	3370	2881	2577	4000

Note: NA: Indicates data not available.

Table 4: Frequencies and Intensities Wise Seasonal Average Forage Production of *Cenchrus ciliaris*

Kg/ha (DM)

Year	SPRING (S_1)									Average	Control
	F^1			F_2			F_3				
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3		
1984	860	1265	1168	1098	1078	1120	1303	1205	1595	1188	1613
1985	1580	2010	2100	2190	1650	2090	1580	1790	1470	1829	1610
1986	410	683	650	510	373	519	635	583	460	536	543
1987	632	1035	970	1392	885	752	1275	1350	675	996	1062
1988	839	934	873	957	909	722	435	475	417	729	987
1989	1363	998	1665	1465	1228	1173	770	665	683	1105	1223
1990	1317	1135	1693	1400	1260	1250	820	770	800	1160	550
1991	850	500	530	450	300	370	480	960	620	562	590
1992	-	-	-	-	-	-	-	-	-	-	NA
Ave.	982	1070	1206	1175	960	999	912	975	840	1022	1022

Continued

Year	SUMMER (S_2)									Average	Control
	F_1			F_2			F_3				
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3		
1984	1870	1840	1220	2760	2210	1890	3890	3860	2990	2503	4056
1985	570	560	420	970	840	740	2750	2380	1580	1201	-
1986	1635	1553	1710	1380	1413	1600	1038	1423	1078	1425	1553
1987	1039	1117	1311	1052	1472	1289	822	1257	1309	1185	900
1988	1127	1090	1175	1963	1255	1127	610	705	748	1088	1638
1989	1238	1674	1596	1888	1289	1194	1645	1464	2075	1332	388
1990	1002	1240	1191	1630	1327	1120	1028	1092	1604	1248	850
1991	1023	1298	1115	1595	1636	1227	1280	1103	1484	1307	770
1992	1042	1212	1363	1779	1411	1352	1584	1402	1538	1410	1025
Ave.	1172	1288	1233	1668	1428	1282	1627	1632	1600	1141	1397

Contd....

Continued

Year	S_3									Average	Control
	F_1			F_2			F_3				
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3		
1984	5320	5270	5070	8200	6320	5000	8740	9920	8420	6918	1075
1985	520	450	350	880	1010	880	4120	6300	2860	1930	-
1986	3480	3168	4123	3200	3000	3363	2375	3500	3475	3298	2475
1987	1429	1547	1552	2025	1795	1962	2100	1987	2262	1851	2750
1988	1734	2367	1840	2260	1742	2222	2580	2678	2670	2233	2913
1989	1892	1470	1960	1690	1845	1850	2225	2525	2195	1961	-
1990	1040	1637	2030	818	1193	1490	3538	3105	2560	1934	3060
1991	1495	1627	1568	1280	1190	1560	3218	2680	2625	1915	2800
1992	1515	2230	1625	1925	1675	2088	2725	2400	2250	2048	3250
Ave.	2046	2196	2235	2475	2197	2268	3513	3899	3257	2676	4000

Concluded

Year	S_4									Average
	F_1			F_2			F_3			
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3	
1984	-	-	-	NA	-	-	-	-	-	-
1985	-	-	-	NA	-	-	-	-	-	-
1986	3320	4570	4375	4875	4875	3850	4625	4675	3500	4296
1987	1800	2500	2225	2600	2775	2275	2525	1850	2275	2314
1988	3628	4485	3093	3900	4045	4033	4358	4183	3708	3937
1989	3500	4800	3250	4100	4020	3900	4320	4250	3700	3982
1990	3675	3725	5150	5270	4525	4075	5625	3250	4250	4394
1991	3875	3450	4400	4800	4325	4200	5200	3575	4150	4219
1992	3675	3300	3475	4350	3625	3925	3550	3575	3335	3650
Ave.	3353	3833	3707	4271	4027	3751	4315	3623	3564	3827

Table 5: Forage Production in Response to Subsequent Clipping in different Seasons

kg/ha (DM)

Clipping No./scheduled date for each year	SPRING (S_1)									
	F_1			F_2			F_3			
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3	Control
Ist. 1.2.	-	-	-	-	-	-	-	-	-	-
2nd. 10.2.	-	-	-	-	-	-	-	-	-	-
3rd. 1.3.	28	25	28	37	39	35	-	-	-	-
4th 16.3.	31	34	27	-	-	-	66	69	53	-
5th 1.4.	221	211	184	344	255	213	-	-	-	-
6th 16.4.	288	244	306	-	-	-	-	-	-	-
7th 1.5.	324	420	532	699	568	595	779	826	720	781
Total	893	934	1072	1080	862	843	845	895	773	781

Contd....

kg/ha (DM)

Clipping No./scheduled date for each year	SUMMER (S_2)									
	F_1			F_2			F_2			
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3	Control
Ist. 1.5.	792	831	845	1218	977	897	831	873	1000	809
2nd. 16.5.	151	174	187	-	-	-	-	-	-	-
3rd. 1.6.	112	143	103	205	208	192	-	-	-	-
4th 16.6.	35	30	33	-	-	-	240	228	261	-
5th 1.7.	65	82	59	136	136	105	-	-	-	-
6th 16.7.	51	58	46	-	-	-	-	-	-	-
7th 1.8.	46	51	73	155	182	144	446	464	400	1208
Total	1251	1369	1345	1711	1503	1337	1517	1565	1661	2016

Contd....

Concluded

Clipping No./scheduled date for each year	FALL (S_3)									Control
	F_1			F_2			F_3			
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3	
Ist.1.2.	1415	1464	1435	1667	1339	1363	1430	1387	1539	1913
2nd.10.2.	71	99	79	-	-	-	-	-	-	-
3rd. 1.3	206	259	214	340	259	293	-	-	-	-
4th. 16.3.	240	281	280	-	-	-	955	1228	1080	-
5th. 1.4.	140	217	205	451	443	503	-	-	-	-
6th. 16.4.	123	141	196	-	-	-	-	-	-	-
7th. 1.5.	149	192	190	357	366	361	1318	1476	1093	4029
Total:	2345	2653	2600	2814	2407	2519	3703	4091	3711	5942

Clipping No./scheduled date for each year	WINTER (S_4)									Control
	F_1			F_2			F_3			
	I_1	I_2	I_3	I_1	I_2	I_3	I_1	I_2	I_3	
Ist.1.11.	3329	3809	3691	4240	4000	3300	4290	3636	3547	6214
2nd.16.11.	11	11	8	-	-	-	-	-	-	-
3rd. 1.12.	11	10	9	27	22	29	-	-	-	-
4th. 16.12.	-	-	-	-	-	-	23	26	16	-
5th. 1.1.	-	-	-	-	-	-	-	-	-	-
6th. 16.1.	-	-	-	-	-	-	-	-	-	-
7th. 1.2.	-	-	-	-	-	-	-	-	-	-
Total:	3351	3830	3708	4267	4022	3329	4313	3662	3563	6214