https://doi.org/10.29321/MAJ.10.A04325

Nutritious Forage from Napier and Guinea Grasses

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(Reprinted from Indian Farming, Vol. XI, Nov.—Dec. 1950)

Napier and Guinea grasses are recognized drought-resistant forage crops. They were introduced into the Punjab in 1926, and because of their long life and capability of giving high yields of green stuff without much effort or care were finally recommended for cultivation in the State in 1931. Both these grasses are perennial and supply large quantities of green forage and allow a good number of cuttings during the year. Under irrigation and adequate manuring Napier and Guinea grasses may give as much as 1,000 maunds and 600 maunds of green fodder per acre, respectively. Unless they are cut and used as feed at the stage of optimum growth, they are not likely to provide large quantities of quality and palatable forage.

Both the yield and nutritive value are important prerequisites which determine the acceptance and popularity of forage crops. A study of these factors with respect to the grasses named above, undertaken at the Fodder Research Station, Sirsa in 1937—'38, revealed that these grasses gave large quantities of green forage of high nutritive value if they were cut at the stage of optimum growth at an interval of about 1½ to 2 months, when their leaves were fully developed and flowering stalks were just forming.

Specific experiments were conducted by planting Napier grass 3 ft. each way and Guinea grass 2½ ft. from row to row, and 2 ft. from plant to plant, in unit sub-plots of four rows each on March 4, 1937. Both of these grasses registered good growth and were harvested according to the following schedule:

(a) Cut at interval of four weeks, when the plants were young.

(b) Cut when leaves had fully grown and flowering stalk had begun to form at intervals of eight weeks.

(c) Cut in advanced stage, when canes had formed in the Napier grass and Guinea grass had flowered, i. e. at an interval of 12 weeks.

Yield of forage: The grasses sprout in spring and grow luxuriantly during summer, especially during the monsoons. Thereafter the growth slows down and becomes even stunted. The plants dry up and may even be killed by frost in December or January. After taking the preliminary

non-experimental cutting in June in which Napier grass gave 137 maunds and Guinea grass gave 54 maunds 37 seers per acre, cuttings of both these grasses were taken according to the schedule mentioned above. The summary of green fodder yield data taken from both these grasses is given in Table I;

TABLE I

Total yield of green fodder per acre

Interval between successive cuttings from June to December, 1937	Total of cuttings taken up to June	Total yield of green fodder			
		Napier grass		Guinea grass	
		Total yield	Percentage difference from four weeks	Total yield	Percentage difference from four weeks
		Md. Sr.		Md Sr.	
4 weeks	6	526—0	100—0	87– 8	100,0
8 weeks	3	561—8	107—6	186—15	213,8
12 weeks	2	752—0	144—2	141—16	70,1

From Table I, it will be observed that Napier grass yielded much more than Guinea grass in all the three treatments.

The differences in the yield of green fodder in the two treatments, viz. cutting at four weeks', eights weeks' interval, were not significant in the case of Napier grass. The quantity of forage obtained from a 12-week cutting interval was significantly higher than both these treatments. But on account of coarseness and the development of canes during a longer interval of 12 weeks the quality of forage obtained was much inferior to that obtained in the two treatments. In other words, higher production of less desirable feed was obtained with a longer interval of 12 weeks' duration as compared to lower production of better and more palatable fodder in the first two treatments. The variations in the yield of green fodder as a result of these cutting treatments were very pronounced in the case of Guinea grass. The out-turn was the lowest in the first cutting treatment of four weeks. It was more than doubled in the second treatment indicating its superiority over the first. The yield was less in the '12 week' than that in the '8 week' interval by about 20 per cent, because most of the leaves had dried up by that time but was definitely higher than in the '4 week' cutting interval because of more growth during this period.

From the observations it will be seen that to obtain best results, both as regards yield and palatability, both these grasses should be cut at intervals varying from six to eight weeks during the growing season.

Quality of forage: The quality of forage was assessed on the basis of its palatability and chemical composition. It was observed that the effect of different intervals on the quality of forage, though considerable, varied with the species of the grass. Although in the initial stage, both the grasses grow quickly and are highly leafy, yet Napier grass is conspicuous by its subsequent rapid tendency to develop fairly thick canes. If this grass is allowed to grow uncut for 2½ to 3 months, it becomes very coarse as a consequence of which it becomes less palatable. At a somewhat more advanced stage of growth, it altogether ceases to be a palatable feed for cattle. On the other hand Guinea grass is distinctly more palatable and it remains so for a longer period than Napier grass; its chief characteristic is that it usually bears fine leaves which multiply and persist much longer, even upto the stage of the appearance of panicles.

The results of chemical analysis on dry matter basis of both the grasses cut at varying intervals are given in the Tables II and III.

TABLE II

Effect of various intervals between cuttings on the yield and composition of Napier grass

Interval between two successive cuttings	Date of cutting	Yield of green forage per acre in lb.	Analysis of composition						
			Ash per cent	Fat per cent	Crude fibre per cent	Protein per cent	Nitrogen free extract per cent	Calcium as CAO per cent	Phosphorus as P2O5 per cent
A. *One Month*									
First cutting	14—7—35	19088	19·55	1·07	31·35	8·98	39 05	0·66	0 88
Second ,,	14—8—35	13448	15·26	1·07	29·89	4·87	48·91	0·55	0·73
Third ,,	14—9—35	8728	16·24	1·17	31·30	8·78	42·51	0·74	0·91
Fourth ,,	14–10—35	1476	16·26	1·17	26·04	9·33	47·20	0·69	1·15
Fifth ,,	14–11—35	294	21·22	1·54	23·43	11·86	41·95	1·34	1·25
Sixth ,,	12–12—35	294	19·36	2·09	21·41	14·35	42·79	1·71	1·66
B. *Two Months*									
First cutting	14—8—35	40474	13·25	0·94	34 02	4·87	46·92	0·32	0·62
Second ,,	14–10—35	4722	13·62	1·35	32·58	5·62	46·83	0·44	0·83
Third ,,	14–12—35	820	17·72	1·81	23·53	13·50	43·44	1·22	1·53
C. *Three Months*									
First cutting	14–9—35	594578	11·76	1·15	35·99	6·92	44·18	0·38	0 71
Second ,,	14–12–35	2656	17·21	1·50	24·67	12·51	44·11	1 04	1·50

TABLE III

Effect of various intervals between cuttings on the yield and composition of Guinea grass

Interval between two successive cuttings	Date of cutting	Yield of green forage per acre in lb.	Analysis on per cent basis						
			Ash per cent	Fat per cent	Crude fibre per cent	Protein per cent	Nitrogen free extract per cent	Calcium as CAO per cent	Phosphorus as P2O5 per cent
A. *One month*									
First cutting	14-7-35	1064	14·15	1·89	35·26	11·05	37·65	0·79	0·39
Second ,,	14-8-35	2194	13·29	1·52	34·25	6·27	44·67	0·93	0·52
Third ,,	14-9-35	1104	15·29	1·63	33·02	8·90	41·16	0·93	0·72
Fourth ,,	14-10-35	1400	15·63	1·65	29·00	8·78	44·94	0·98	0·89
Fifth ,,	14-11-35	258	18·61	1·37	23·66	14·35	42·01	1·22	0·58
Sixth ,,	14-12-35	214	17·45	2·60	24·86	13·92	41·17	0·86	1·13
B. *Two months*									
First cutting	14-8-35	8724	12·09	1·65	38·64	4·45	43·17	0·64	0·37
Second ,,	14-10-35	6192	13·72	1·89	34·66	5·80	43·93	0·76	0·53
Thirp ,,	14-12-35	344	18·05	2·38	26·20	10·58	42·79	1·51	1·02
C. *Three Months*									
First cutting	14-9-35	11164	9·71	1·81	30·84	3·24	45·40	0·49	0·33
Second ,,	14-12-35	1004	15·27	2·23	36·40	7·34	38·76	1·35	0·87

The results of analysis pertaining to Napier grass show that the fibre content of its first cutting after an initial interval of three months uninterrupted growth, was the maximum, viz. 35·99 per cent as compared to 31·55 per cent and 34·02 per cent respectively, of the first cutting of one and two months interval. This, in other words, means that the longer the first cutting of the Napier grass is delayed, the lesser will be its palatability because of its enhanced fibre content. Unlike it however, the fibre content of the last cuttings of the various intervals were substantially low, 21·41, 23·53 and 24·67 per cent, respectively, for one, two and three months intervals, vis-a-vis the first cuttings of these intervals. The percentage of protein, fat, calcium and phosphorus showed a steep rise in samples of successive cuttings of various intervals with the exception of first three consecutive cuttings of one month interval.

In Guinea grass, the results show that fibre, fat and calcium contents of the cuttings at various intervals were like those of Napier grass. It is interesting to note however, that forage of Guinea grass of various cuttings has invariably given higher fat values as compared to the corresponding values in Napier grass. The protein content (11·05 per cent) of its first cutting after one month's growth was considerably higher than the corresponding values of 8·98 per cent of Napier grass. But there was a marked, though gradual and consistent decrease in the protein contents of

first cutting of Guinea grass with increase in the cutting intervals. The comparatively lower ash content of the Guinea grass indicates the softness of its texture as a feed for cattle.

Taking an over all view of the various aspects of quality it may be concluded, that Napier grass can be profitably cut after one or two months growth before cane formation and development of coarse leaves The superiority of Guinea to Napier grass as a feed is indisputable. The former would provide abundant succulent feed if the interval between two successive cuttings is limited to two months. But the longer these grasses are allowed to grow, i. e. beyond two months, the more fibrous and hence coarser they become, which adversely affects their palatability and nutritive value.

OBITUARY

We regret to announce the sudden and untimely demise of one of our distinguished patrons, Sri V. Arumugam Pillai,

at Rathnasabapathipuram, Coimbatore on 11-12-1951. Apart from his prominent place in the civic life of Coimbatore, he took also a very keen interest in the welfare of the peasants and the improvement of agriculture in general. He was a member of the Taluk and District Boards and was the Chairman of his Village Union Board for a number of terms. He was also a Trustee of the Perur Devasthanam for over ten years. He leaves behind his wife, one son and a daughter. May his soul rest in peace.