

Influence of Nitrogen and Stages of Cutting on the Yield of Hybrid Napier Grass Varieties

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Three varieties of hybrid Napier grass viz., NB-21, BN-2 and 1697 X p. p. were grown under three levels of N (0, 50 and 100 kg N/ha) and three stages of cutting (35, 40, and 45 days interval). In each stage three cuttings were taken for this study. The results of the study indicated that the variety 1697 X P. p. recorded the highest green matter yield, followed by BN-2 as compared to the ruling variety NB-21. BN-2 recorded the highest dry matter yield followed by 1697 X P. p as compared to NB-21. Cutting the grass at an interval of 45 days gave the highest green matter and dry matter yield. The highest green matter and dry matter yields were obtained with the application of 100 kg N/ha over 50 kg N/ha and control. The dry matter content increased with maturity and decreased with N application.

Though, grasses and legumes are the cheapest source of feed for ruminants, greater attention has to be given to grasses, since they are high yielding and perennial in nature. Hybrid Napier is an important grass grown under varying agro-climatic conditions. Several varieties of them are grown, cut at various stages of growth and fed to the animal. The varieties differ in their yield potential and their response to N fertilization. In this investigation, an attempt was made to study the effect of N application and stages of cutting on the yield of three hybrid Napier grass varieties.

MATERIAL AND METHODS

Three hybrid Napier grass varieties (NB-21, BN-2 and 1697 x P.p.) were fertilized with three levels of nitrogen

(0, 50 and 100 kg N/ha) and cut at three stages (35, 40 and 45 days interval). At every stage the grass was cut thrice at the interval of 35, 40 and 45 days. Main plots were assigned to varieties and stages of cutting and the sub-plots were allotted to nitrogen levels. The spacing adopted was 50 cm x 50cm. Nitrogen was applied to the plots as urea and 50 kg P₂O₅/ha and 40 kg K₂O/ha were applied to all plots as a common dose as superphosphate and muriate of potash respectively. The grass was cut uniformly at 15 cm height above the ground level after 60 days of planting. The grass varieties were allowed for regrowth. The crop was harvested on 35th, 40th and 45th day and the green matter yield was recorded. Representative plant samples in each treatment were collected

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immediately after the harvest for determining the dry matter content and dry matter yield.

RESULTS AND DISCUSSION

The results of statistical analysis of green matter yield, dry matter content and dry matter yield along with mean values are presented in Table.

GREEN MATTER YIELD

The green matter yield differed significantly among the varieties in all the three cuttings. The variety 1697 X P. p. had the highest yield potential, but the difference in yield between the two varieties viz., 1697 X P. p. and BN-2 was not very wide. Comparing the poor yielder NB-21 with other two varieties, the percentage increase of green matter yield over that of NB-21 was 21.91, 19.90 and 11.38 per cent for BN-2 and 13.30, 23.40 and 15.90 per cent for 1697 X P. p. respectively for the first, second and third cuttings, respectively. Such differences in the green matter yield in hybrid Napier varieties were also reported by Gill *et al.* (1972), Gupta *et al.* (1974) and Barevadia *et al.* (1976).

The green matter yield also increased with advancement in age of the crop. The highest yield was recorded on 45th day. The increase in yield over 35th day was in the order of 5.96, 13.41 and 12.50 per cent respectively for the 1st, 2nd and 3rd cuttings on 40th day. But the yield increase was 36.61, 25.94 and 26.58 per cent res-

pectively for the 1st, 2nd, and 3rd cuttings on 45th day. From this, it can be concluded that for optimum green matter yield, hybrid Napier varieties should be harvested at an interval 45 days. The result obtained is in conformity with the work of Shukla *et al.* (1970), Tomer *et al.* (1974), Chin and Hong (1975) and Muldoon and Pearson (1977).

Application of N had resulted in significant increase in the green matter yield in all cuttings. The yield increase was in the order of 28.88, 27.32 and 35.87 per cent respectively for the 1st, 2nd and 3rd cuttings for 100 kg N/ha over control. Considering the over all increase in green matter yield due to the application of N, the level at 100 kg N/ha may be profitable. Similar results endorsing the application of N at 100 kg/ha for hybrid Napier were reported earlier by Mani (1977).

DRY MATTER CONTENT

The varietal influence on the dry matter content was manifested for the 1st and 2nd cuttings. The variety NB-21 had higher dry matter content over the other varieties. The dry matter content increased progressively with the age of the crop. This observation is in accordance with the findings of Natarajan (1976) and Mani (1977). The increase in dry matter content may be due to the deposition of cell-wall components. Application of N was found to decrease the dry matter content. This reduction may be due to the succulence of the plant tissue as

a result of increased N concentration in the plant.

DRY MATTER YIELD

The dry matter yield computed after dry matter content showed striking differences, for varieties, stages of cutting as well as N levels. The variety NB-21 proved to be a poor performer from the point of view of dry matter yield also. Gupta (1975), Barevadia *et al.* (1976) and Carvalho *et al.* (1975) reported variations in dry matter yield due to varieties. The dry matter yield also increased with maturity of the crop and also with cuttings. The increase in dry matter yield on 45th day may be due to the higher dry matter content in the later stages of the crop as well as to increased green matter yield. Similar results were also reported by Shukla *et al.* (1970) and Rakkiyappan (1976). Application of N also increased the dry matter yield over control though it exercised a depressive effect on the dry matter content. Significant increases in dry matter yield at 100 kg N/ha over 50 kg/ha and control highlighted the application of N at 100 kg/ha for hybrid Napier grass. Similar increases of dry matter yield at varying degrees to different levels of N were reported by Barevadia *et al.* (1976) and Hakoishi *et al.* (1976).

The first author wishes to acknowledge with thanks the award of state Merit Scholarship by the Tamil Nadu Government. The authors are also

thankful to the Tamil Nadu Agricultural University, for according permission for publishing the M. Sc. (Ag) thesis of the first author.

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TABLE Results of statistical analysis and Mean yield of Hybrid Napier grass varieties.

	Green matter yield (t/ha)			Dry matter content			Dry matter yield (t/ha)		
	1st cut	2nd cut	3rd cut	1st cut	2nd cut	3rd cut	1st cut	2nd cut	3rd cut
Varieties									
NB-21	26.93	29.19	32.08	16.14	22.16	—	4.40	6.47	7.25
BN-2	32.83	35.00	35.73	15.70	21.32	—	5.18	7.45	8.39
1697 × P. p.	30.44	36.02	37.18	13.32	20.11	—	4.11	7.17	8.42
S. E.	0.63	0.41	0.47	0.17	0.09	N. S.	0.07	0.09	0.10
C. D.	1.90	1.22	1.39	0.51	0.27	—	0.20	0.26	0.30
Stages of cutting :									
35 days	26.33	29.53	30.96	12.87	20.33	22.47	3.35	5.91	6.68
40 days	27.90	33.49	34.83	14.87	21.05	22.57	4.13	6.97	7.94
45 days	35.97	37.19	39.19	17.42	22.21	23.46	6.22	8.21	9.13
S. E.	0.63	0.41	0.47	0.17	0.09	0.17	0.07	0.09	0.10
C. D.	1.90	1.22	1.39	0.51	0.27	0.51	0.20	0.26	0.30
Nitrogen levels (kg/ha)									
0	26.14	24.43	29.33	16.03	22.42	23.91	4.24	6.60	7.11
50	30.37	33.32	35.81	15.01	21.11	22.68	4.63	7.03	8.13
100	33.69	37.47	39.85	14.11	20.06	21.86	4.83	7.47	8.61
S. E.	0.56	0.60	0.42	0.10	0.15	0.12	0.08	0.11	0.11
C. D.	1.60	1.72	1.20	0.30	0.44	0.37	0.24	0.33	0.33