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ECONOMICS AND VARIETAL PERFORMANCE OF HYBRID NAPIER AND GUINEA GRASS UNDER IRRIGATED CONDITIONS OF NORTHERN KARNATAKA

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SUMMARY

Less availability of good quality green forages has led to low productivity from national dairy herd. Growing fodder to suit the particular production system is an efficient and economical solution for this problem. Perennial grasses particularly Hybrid Napier and guinea grass are high yielding fodder grasses. Keeping this in view, a field experiment was conducted at Main Agricultural Research Station, Raichur, Karnataka for two subsequent years of 2010-11 and 2011-12 under irrigated conditions in medium black soils having 0.63 per cent organic carbon, 217 kg/ha available nitrogen, 61 kg/ha available phosphorus and 120 kg/ha available potassium with 8.9 pH to explore the performance of perennial grasses under irrigated condition. The treatments comprised six Hybrid Napier cultivars viz., NB-21, DHN-6, APBN-1, IGFRI-7, Phule Jaywanth and CO-3 and two cultivars of Guinea grass viz., Nadani and Samrudhi. A total of eight treatments were laid out in randomized block design with three replications. The pooled results of two years revealed that Hybrid Napier cv. DHN-6 recorded significantly higher green fodder yield (710 q/ha), however, which was on par with the Hybrid Napier cultivars DHN-6, APBN-1, IGFRI-7, Phule Jaywanth and CO-3. Significantly lower green fodder yield was recorded by NB-21 cultivar (411 q/ha). Among different perennial grasses, the highest net returns (Rs. 55863/ha) and B : C ratio (2.70) were obtained with Hybrid Napier cultivar DHN-6 and closely followed by APBN-1 (Rs. 53449/ha and 2.63). The lowest was with NB-21 cultivar (Rs. 20440/ha and 1.66).

Key words : Perennial grasses, Hybrid Napier, Guinea grass, irrigated conditions, green forage yield

Resembling the other south and south-east Asian countries in India, low productivity of dairy animals could be accredited to the less availability of forage together with poor quality. To maximize the milk production, it is essential to feed animals with quality green fodder. Consequently, high yielding forages including number of varieties of Napier Hybrids and Guinea grass have been introduced recently. Due to various reasons, growing forage crops is a new concept for most of the farmers, unlike growing other cash crops (Premaratne and Premalal, 2006).

Livestock farming will give more profit than agriculture. But without agriculture, it will never give a coin. Now, it is our time to think about the intercropping of agriculture and livestock farming. Whatever the livestock we prefer to rear, we should primarily bother about feeding them. To purchase all the ingredients of feed is unprofitable. So, we should produce the feeding materials of our own. Concentrates and roughages are the two major components of livestock feeds. Roughages require in bulk quantity than the concentrates. That is why we cultivate fodder grass (Concentrates also can be prepared by us cultivating certain fodder crops).

Hybrid Napier and Guinea grass are the widely cultivated fodder grasses in the region. These are most adopted forage crops in northern Karnataka due to their quick growth, high yield potential, better palatability, digestibility and rooting ability (Kakkar *et al.*, 1986). These are advantageous in various ways such as saving in cost of production, and high yield in short period. Rationing also offers an opportunity of continuous supply of green forage (Tiwari *et al.*, 1975). Keeping in view the above facts, the present study was conducted to explore the best compatible genotypes of perennial grasses under irrigated conditions.

MATERIALS AND METHODS

The field experiment was conducted during 2010-11 and 2011-12 at Main Agricultural Research Station, Raichur, Karnataka, on medium black soil having 0.63 per cent organic carbon, 217 kg/ha available nitrogen, 61 kg/ha available phosphorus and 120 kg/ha available potassium with 8.9 pH. The treatments comprised six Hybrid Napier cultivars, viz., NB-21, DHN-6, APBN-1, IGFRI-7, Phule Jaywanth and CO-3 and two cultivars of Guinea grass viz., Nadani and Samrudhi. A total of eight treatment combinations were laid out in randomized block design with three replications. The farm yard manure was incorporated 15 days before planting of grasses. The stem cuttings/root slips were planted in second fortnight of June with a spacing of 60 x 60 cm spacing. The recommended dose of fertilizers was applied to all the grasses 15 days after planting in the form of urea, DAP and muriate of potash (MOP). The first irrigation was applied immediately after planting and thereafter irrigation was given at an interval of 13-15 days depending upon the climatic conditions. The first cutting was taken about 65 days after transplanting (DAT) and subsequent cutting at an interval of 35-40 days (about 1 m height). During first year (2010-11) four cuts and second year (2011-12) six cuts were taken. The growth and yield observations were recorded from the net plots and green fodder yield (GFY) of various grasses were converted on hectare basis in quintals. The protein content was analysed which formed the composite sample. The economics of each treatment was computed with prevailing prices of green grasses during corresponding years. The data of two years were statistically analyzed and discussed on pooled basis. The yield was further computed in terms of gross and net returns as well as B : C ratio to assess the profitability.

RESULTS AND DISCUSSION

In general, the trend of yield in 2010-11 and 2011-12 was almost similar, probably due to similar rainfall pattern and weather parameters. The error variances for the yield during all the three seasons were found homogeneous and, therefore, the pooling of data was done.

Growth Parameters

Pooled data of two years showed significant variation w. r. t. plant height, number of tillers per plant and leaf : stem ratio (Table 1).

Significantly higher plant height was recorded with NB-21 (264 cm), however, which was on par with all the cultivars of Hybrid Napier except Phule Jaywanth. Significantly lower plant height was noticed in Guinea grass cv. Nandani (170 cm). Hybrid Napier cv. DHN-6 recorded significantly higher number of tillers (34), however, which was on par with the Hybrid Napier cv. APBN-1 and Guinea grass cv. Samrudhi. Lowest was with NB-21 cultivar (20). However, Guinea grass cv. Nandini recorded significantly higher leaf : stem ratio (3.20) closely followed by Guinea grass cv. Samrudhi

TABLE 1
Green fodder yield (GFY), yield attributes, protein content and crude protein yield (CPY) of perennial grasses under irrigated condition (Pooled data)

Treatment	Plant height (cm)	No. of tillers/ clump	Leaf : stem ratio	Green fodder yield (q/ha)			CP (%)	CPY (q/ha)
				2010-11 (4 cuts)	2011-12 (6 cuts)	Pooled		
Hybrid Napier (NB-21)	264	20	0.94	354	468	411	6.05	24.80
Hybrid Napier (DHN-6)	223	34	2.93	633	787	710	9.95	70.76
Hybrid Napier (APBN-1)	226	27	2.64	616	765	690	9.18	62.91
Hybrid Napier (IGFRI 7)	249	24	2.56	606	739	672	8.45	56.79
Hybrid Napier (CO-3)	232	25	2.51	593	707	650	9.39	60.71
Hybrid Napier (Phule Jaywanth)	214	23	2.27	611	728	670	8.14	53.98
Guinea grass (Samrudhi)	177	29	3.08	532	594	563	10.47	59.12
Guinea grass (Nandini)	170	24	3.20	500	557	529	10.49	55.16
S. Em±	14	2	0.03	57	50	37	0.59	3.57
C. D. (P=0.05)	41	7	0.09	NS	150	111	1.78	10.83

NS–Not Significant.

(3.08). The lowest leaf : stem ratio was observed in NB-21. The results are in conformity with the findings of Nilanthi *et al.* (2004).

Green Fodder Yield

Pooled data of two years showed significant variation in green fodder yield (GFY) among different perennial grasses tried under irrigated ecosystem. Hybrid Napier cv. DHN-6 recorded significantly higher green fodder yield (710 q/ha) (Table 1). This was mainly because of highest plant height and number of tillers obtained in this cultivar and also may be due to quick growth, high yield potential, better palatability, digestibility and rooting ability as reported by Kakkar *et al*. (1986). The similar findings have also been reported by Sindhu *et al*. (2001), however, which was on par with the other cultivars viz., APBN-1, IGFRI-7, Phule Jaywanth and CO-3. Significantly lower green fodder yield was recorded by NB-21 cultivar (411 q/ha). This was mainly because of lower number of tillers and leaf : stem ratio.

Quality Parameters

Pooled data of two years showed that significant higher protein content was recorded in Guinea grass cv. Nandini (10.49%) followed by Guinea grass cv. Samrudhi (10.47%), Hybrid Napier cv. DHN-6 (9.95%), CO-3 (9.39) and APBN-1 (9.18%). Lower protein content was recorded in NB-21 (6.05%). Even though protein content was higher in both the varieties of Nandini grass, crude protein yield (CPY) was significantly higher in Hybrid Napier cv. DHN-6 (70.76 kg/ha) (Table 1). This was mainly because of higher GFY obtained in DHN-6, however, which was on par with APBN-1 and CO-3. The results are in conformity with the findings of Tiwana *et al.* (2004).

Economics

The economic analysis indicated that the highest net returns (Rs. 55863/ha) and B : C ratio (2.70) were obtained with Hybrid Napier cultivar DHN-6 and closely followed by APBN-1 (Rs. 53449/ha and 2.63) (Table 2). The lowest was with NB-21 cultivar (Rs. 20440/ha and 1.66). This is in confirmation of results represented by Suneetha *et al.* (2004) and Premaratne and Premalal (2006).

It was concluded that based on the two years' data, the Hybrid Napier genotypes DHN-6 and APBN-1 proved more suitable under irrigated conditions of northern Karnataka with highest green fodder yield, crude protein yield, net returns and B : C ratio.

TABLE 2
Economics of perennial grasses under irrigated conditions (Pooled data)

Treatment	Green fodder yield (q/ha)	Gross returns (Rs./ha)	Net returns (Rs./ha)	B : C ratio
Hybrid Napier (NB-21)	411	51409	20440	1.66
Hybrid Napier (DHN-6)	710	88705	55863	2.70
Hybrid Napier (APBN-1)	690	86291	53449	2.63
Hybrid Napier (IGFRI 7)	672	84023	51181	2.56
Hybrid Napier (CO-3)	650	81250	48408	2.47
Hybrid Napier (Phule Jaywanth)	670	83697	50855	2.55
Guinea grass (Samrudhi)	563	70384	38092	2.18
Guinea grass (Nandini)	529	66094	34551	2.10
S. Em±	37	4580	4580	0.14
C. D. (P=0.05)	111	13892	13892	0.43

REFERENCES

Kakkar, V. K. , K. P. Puri, and M. S. Tiwari, 1986 : *Agricultural Science Digest,* **6** : 1-21.

Nilanthi, J., S. Premaratne, and G. G. C. Premalal, 2004 : In : Proc. 12th Annual Students' Research Sessions, Dept. of Animal Science, Univ. of Peradeniya. Pasture Division, Veterinary Research Institite, Gannoruwa, Peradeniya. pp. 13-14.

Premaratne, S. and G. G. C. Premalal, 2006 : A resourceful fodder grass for dairy development in Sri Lanka. *J. Agric. Sci.,* **2** : 22-33.

Suneetha, K. B., Madhusdudhan Reddy, and Mir Azam Sultan, 2004 : *Forage Res*., **30** : 49-52.

Tiwana, M. S., K. P. Puri, U. S. Tiwana, and Ajaib Singh, 2004 : *Forage Res*., **30** : 83-85.

Tiwari, M. S., D. S. Bain, and G. S. Gill, 1975 : *J. Res. Punjab agric. Univ.,* **12** : 346-350.