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Study on the response of Bajra Napier hybrid grass to various levels of nutrients

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Abstract

Fodder crops cultivation in India is gaining momentum to overcome the feed and fodder shortages for the farm animals. Application of nutrients for fodder crops is a rare phenomenon and the package of practices are not adopted by the farmers to increase the productivity. Fodder crops are almost negligible crops in our country. Field experiments were conducted in order to study the response of Bajra Napier hybrid grass to various levels of nutrients in different seasons. Top dressing of 100 Kg/ha of Nitrogen (N) after each cut is the normal recommendation. However, information on top dressing of Phosphorous (P) and potassium (K) in the region is not available. Hence, this field study was carried out with the objectives to assess the response of Bajra Napier hybrid grass to various levels of nutrients viz., N, P&K and find the optimum dose for getting maximum yield. The experiment was laid out in Randomized Block Design with three replications. All the three major nutrients were tried in seven levels. Basal dose of 50:50:40 kg/ha of N, P₂O₅ & K₂O applied commonly for all the plots at the time of planting. 100 kg nitrogen, 50 kg phosphorous and 40 kg Potassium kept as 100 % RDF. After each cut N, P & K were applied as top dress at various levels. The green fodder yield was recorded. The results revealed that there was a gradual increasing trend in the green fodder yield with increase in the nutrient levels. Beyond the optimum dose declining trend was observed. With regard to various levels of nutrients N @ 200% (200 Kg/ha), P@50 % (25 kg/ha) and K @ 150% (60 Kg/ha) after each cut was found to be the best for getting the highest green fodder yield in Bajra Napier Hybrid grass.

Keywords: Bajranapier hybrid grass, nutrients, bio mass, optimum level

Introduction

India is basically an agricultural country and nearly three-fourth population depends on Agriculture, livestock and allied sectors for livelihood. Livestock is a key source of supplementary income and livelihood especially for small land holdings and landless rural poor households. However, the productivity of animals is low compared to the world average. One of the main reasons for the low productivity of our livestock is malnutrition, under-nutrition or both, beside the low genetic potential of the animals. India is highly deficient in respect of availability of green fodder, dry fodder and concentrates the deficiency of green fodders for animals are more pronounced for reduced yield. Hence, it is necessary to include fodder crops along with cultivation of other crops for providing green fodders for the animals. Bajra Napier hybrid grass is a valuable, high biomass producing tropical grass and is well recognized throughout our country for its palatability and good fodder quality. Variety Co (CN) 3 is widely cultivated in Tamil Nadu as an irrigated perennial grass. This is a crop that requires higher nitrogen application for its better productivity and to provide palatable fodder throughout the year. It contains 9.5% crude protein, 2.5% oxalate and IVDMD% of 60.65%, and hence supplementation of nutrients both micro and macro nutrients are essential (Purushotham, 1998) [3]. Mineral nutrition, especially nitrogen contributes to the structural organization of the leaf blade and thereby enhances the quantity and quality of leaves. It is found that, given the increasing amount of nitrogen fertilizer, the increase yield is proportional (Kano *et al.*, 2007) [1]. However; the application of nutrients to fodder crops is negligible. Only limited studies are available on fodder crops pertaining to the application of nutrients especially nitrogen fertilization in bajranapier hybrid grass. Now a days, more attention is also paid for enhancing the quality of feed and forages in order to enhance the productivity of livestock. Therefore the present study examined with an objective to assess the response of bajranapier hybrid grass to the various levels of nutrients and find out the optimum dose of nutrients viz., nitrogen, phosphorus and potassium as top dress to get maximum yield.

Materials and Methods

The experiment was laid out in the farm of karaikal. The experimental site has sandy lay loam

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soil with low in available nitrogen, medium in phosphorous and high in potassium nutrients. The trial was laid out in randomised block design with three replications. All the three major nutrients viz., N, P₂O₅ & K₂O applied commonly for all treatments at the time of planting. 100 Kg nitrogen, 50 Kg phosphorous and 40 kg potassium kept as 100 % recommended dose. After each cut, N, P & K were applied as top dress at various levels of nutrients viz., 0,50,100, 150,200,250 and 300 %.

The first cutting was made at 75 days after planting and subsequent cutting was carried out at every 45 days interval. Totally 6 harvests were taken the green fodder yield was recorded and the response of bajranapier hybrid grass to the various levels of nutrients were studied.

Results and Discussion

The results revealed that BN hybrid grass Co 3 had a very good response to top dressing of nitrogen than phosphorous and potassium. There was a gradual increasing trend in the green fodder yield with increase in the nutrient levels. Beyond the optimum level, declining trend was observed in the green fodder yield. With regard to various levels (Table 1), N @200 % i.e., 200 Kg/ha after each cut significantly recorded the highest green fodder yield of 113 t/ha followed by N @ 250 kg/ha. Phosphorous @ 50 % i.e., 25 kg/ha after each cut was found to be the best since P @ 100,150 and 200 % are on par with each other. Potassium @150 % i.e., 60 kg/ha after each cut significantly recorded the highest green fodder yield (28.57 t/ha). Higher yield of green fodder obtained due to addition of N maybe attributed to the fact that N is an important constituent of amino acids and chloroplasts which directly influenced plant growth and development through greater photosynthates. Similar finding was recorded by Venila and Sankaran, 2017.

Biomass yield of Bajranapier grass vary significantly depending on variety, age, season, location and management practices (Ogoshi *et al.* 2010; Rengsirikul *et al.* 2011; Xie *et al.* 2011) [2, 4, 6]. Season wise green fodder analysis showed that summer season recorded the highest green fodder yield followed by *kharif* and *rabi* season for all the nutrients.

Table 1: Impact of various levels of nutrients on the total green fodder yield (t/ha) of BN hybrid grass

Treatment	Nitrogen	Phosphorous	Potassium
Levels (%)			
0	23.21	15.75	22.97
50	44.41	24.17	24.40
100	56.32	23.51	25.92
150	69.21	23.12	28.57
200	113.93	22.09	27.12
250	103.82	22.03	25.73
300	85.61	20.54	25.19
CD (P=0.05)	9.21	1.73	1.96
Season			
<i>Kharif</i>	145.71	32.40	38.79
<i>Rabi</i>	113.73	36.50	33.35
Summer	237.07	80.25	108.03
CD (P=0.05)	10.43	8.95	9.73

From this study, it could be inferred that 200-25-60 kg N, P₂O₅ & K₂O/ha after each cut was found to be the optimum level of nutrients for getting the highest green fodder yield in BN hybrid grass in the coastal region of karaikal.

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