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Research Communication

Effect of varieties and nitrogen fertilization on fodder pearlmillet (*Pennisetum glaucum*) in north western Rajasthan

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ABSTRACT

A field experiment carried out at Bikaner during the *kharif* season of 2007 revealed that pearlmillet {*Pennisetum glaucum* (L.) R. Br. Emend. Stutz} cv. 'Rajasthan Bajra Chari-2' is superior in varieties in plant height, dry matter, tillers/plant, crude protein, green and dry fodder yields, net returns and B:C ratio as compared to other varieties. Similarly, application of nitrogen up to 120 kg/ha significantly enhanced the plant height, dry matter, tillers/plant, crude protein, green and dry fodder yields net returns and B:C ratio.

Key words : Crude protein, Cultivars, Green and dry fodder yields, Nitrogen, Pearlmillet

The requirement of green fodder was 612 million tonnes against the availability of only 224 million tonnes in 2005. Pearlmillet is the most important *kharif* crop of Rajasthan grown on marginal soils under rainfed conditions. However, its yield in general is low because of erratic behaviour as well as early withdrawal of monsoon. It reflects a wide gap between demand and supply. Besides this, is because of increasing pressure of human population on land is also resulting top priority for grain production on the role of improved varieties and N in improving the productivity of pearlmillets for fodder, limited information is available.

A field experiment was carried out at the Agronomy farm, College of Agriculture, Bikaner during the *kharif* season of 2007. The experiment situated at 28.01°N latitude and 73.22°E longitude at an altitude of 234.70 metres above mean sea level. Potential evapo-transpiration in this region ranges between 1500-2000 mm. The experimental field was loamy sand in texture, slightly alkaline in reaction (pH 8.36), poor in organic carbon (0.07%), low in available nitrogen (88.25 kg/ha) and medium in P_2O_5 (23.80 kg/ha) and K_2O (169.0 kg/ha). The experiment was laid out in a split plot design with three replications allocating four fodder varieties of pearlmillet *viz.*, 'Rajasthan Bajra Chari-2', 'Pusa Bajra 266', 'Raj 171'and 'Giant Bajra' in main plots and five levels of nitrogen *viz.*, 0, 40, 80, 120 and 180 kg/ha in subplots. The seeds of different varieties of fodder pearlmillet were sown @10 kg/ha rows 30 cm apart on the onset of monsoon (17th July, 2007) in open furrows. Recommended dose of phosphorous @ 20 kg/ha- and half dose of nitrogen as per treatment were applied as basal in rows and rest half of nitrogen was top dressed at 3 week stage of crop. The rainfall received during crop season was 121.9 mm.

In respect of plant height, dry matter, tillers/plant, crude protein, green and dry fodder yields, net returns and B:C ratio the different fodder pearlmillet varieties were in the following order: 'Rajasthan Bajara Chari-2'> 'Giant Bajra'> 'Raj-171'> 'Pusa Bajra-266'; 'Rajasthan Bajara Chari-2' recording the highest and 'Pusa Bajra-266' the lowest value. Differences between the different varieties were significant (Table 1).

N application increased green fodder yield significantly upto 120 kg/ha. There was no significant increase when N level raised to 160 kg/ha. At 80 and 120 kg N/ha given fodder yield was at par. However, as regard dry fodder yield, a significant increase was recorded upto 80 kg N/ha and there was no significant increase when N levels was raised to 120 or 160 kg/ha. Net returns and B:C ratio increased significantly upto 120 kg/ha, there being no significant increase when the levels of N increased upto 160 kg/ha. A number of researchers have recorded an increase in fodder yield of bajra due to N fertilization (Gupta *et al.* 1995; Jhakar *et al.* 2003; Hooda *et al.* 2004; and Tiwana *et al.* 2004)

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Table 1. Effect of varieties and nitrogen levels on plant height, dry matter, tillers/plant, crude protein, green and dry fodder yield of pearl millet

Treatment	Plant height (cm)	Dry matter (g/plant)	Tillers/ plant (No.)	Crude protein (%)	Yield (t/ha)		Net returns (×10³ ₹/ha)	B:C ratio
					Green fodder (t/ha)	Dry fodder (t/ha)		
Varieties								
'Rajasthan *Bajra* Chari-2'	178.9	32.0	5.4	11.4	39.81	10.12	14.96	3.38
'Pusa *Bajra* -266'	131.6	18.6	3.7	8.6	29.44	5.53	9.27	2.50
'Raj-171'	144.4	21.7	4.1	9.6	33.03	6.92	11.24	2.81
'Giant Bajra'	160.2	26.1	4.8	10.5	36.43	8.14	13.11	3.10
SEm±	3.66	0.99	0.08	0.22	0.76	0.19	0.08	-
CD (P=0.05)	12.7	3.44	0.27	0.77	2.65	0.66	0.27	-
Nitrogen level (kg/ha)								
0	134.0	13.6	4.0	8.3	29.22	6.7	9.99	2.65
40	145.3	20.3	4.3	9.2	32.13	7.2	11.17	2.82
80	155.8	25.9	4.6	10.3	35.21	7.7	12.42	3.00
120	165.9	30.7	4.8	11.1	37.92	8.2	13.50	3.14
160	168.0	33.2	4.9	11.3	39.01	8.4	13.67	3.13
SEm±	3.23	1.09	0.08	0.21	0.87	0.16	0.17	-
CD (P=0.05)	9.32	3.13	0.24	0.6	2.51	0.64	0.48	-

Thus in general fodder bajra can be fertilized with 120 kg N/ha and 'Rajasthan Bajara Chari-2' is the most productive among the genotypes.

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