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PERFORMANCE OF BAJRA NAPIER HYBRID VARIETIES IN SOUTHERN DRY ZONE OF KARNATAKA FOR THE KHARIF SEASON OF DIFFERENT YEARS

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SUMMARY

A field experiment was conducted at Zonal Agricultural Research Station, Visweswaraiah Canal Farm, Mandya (Karnataka) during **kharif** seasons of 2009, 2010 and 2011 to study the performance of Bajra Napier Hybrid varieties in southern dry zone of Karnataka. The experiment consisted of 10 varieties viz., BNH-10, NHN-9, TNCN-07-3, BNH-3, TNCN-07-4, DHN-09, DHN-12, TNCN-07-1, TNCN-07-2 and PNB-233 and were compared with local check CO-3. The soil of experimental site was red sandy loam with neutral soil pH (6.95), medium in available nitrogen (262.5 kg/ha), phosphorus (28.61 kg/ha) and potassium (153.65 kg/ha). The experiment was laid out in randomized complete block design with three replications. The pooled data revealed that variety BNH-10 recorded significantly higher green forage yield (1431.4 q/ha), dry matter yield (269.02 q/ha), crude protein yield (18.41 q/ha) and growth parameters like plant height (111.64 cm) and leaf-stem ratio (0.76).

Key words : Napier grass, bajra napier hybrid varieties, green forage yield, crude protein

Napier grass (*Pennisetum purpureum*) commonly referred to as elephant grass, is popular fodder crop for small scale dairy farmers in the high and medium potential dairy production areas of Karnataka under the cut & carry system of production. It is a fast growing, deeply rooted, perennial grass growing up to 4 m tall that can spread by underground stems to form thick ground cover. Napier is easy to establish and persistent, drought tolerant, suitable for cutting and very good for silage making. It is also used as a soil stabilizer in soil conservation methods and can be intercropped with various forage legumes. It is vulnerable to disease and pest attacks. It can be grown at an altitude of 2000 m above mean sea level. When grown at altitudes above 2000 m, growth and regeneration after cutting is slow and it may die due to frost. It does best in high rainfall areas, over 1500 mm per year. Napier grass can grow in almost any soils; but does best in deep, fertile, well drained soils. Keeping the above things in view, the present investigation was carried out to find out the suitable Bajra Napier Hybrid varieties for southern dry zone of Karnataka.

MATERIALS AND METHODS

A field experiment was conducted during **kharif** season of 2009, 2010 and 2011 at Zonal Agricultural Research Station, Vishweshwaraiah Canal Farm, Mandya (Karnataka) to study the performance of Bajra Napier Hybrid varieties in southern dry zone of Karnataka. The experiment consisted of 10 varieties viz., BNH-10, NHN-9, TNCN-07-3, BNH-3, TNCN-07-4, DHN-09, DHN-12, TNCN-07-1, TNCN-07-2 and PNB-233 and were compared with local check CO-3. The soil of experimental site is red sandy loam with neutral soil pH (6.95), medium in available nitrogen (262.5 kg/ha), phosphorus (28.61 kg/ha) and potassium (153.65 kg/ha). The experiment was laid out in randomized complete block design with three replications. The varieties were planted on 20 July 2008 with common row spacing of 90 and 60 cm between plants. Equal quantity of farm yard manure at the rate of 10 t/ha was applied to each plot three weeks prior to planting**.** The recommended doses of 10 kg of nitrogen, 120 kg P_2O_5 and 80 kg K_2O/ha were applied uniformly as basal dose at the time of planting in the form of urea, single super phosphate and muriate of potash, respectively. The remaining 170 kg of nitrogen was applied in seven equal splits immediately after each cut at 45 days interval in the form of urea for better growth of the crop. Five plants were randomly

selected in each net plot area for taking observations on growth and yield attributing parameters. The crop in each net plot was harvested separately as per treatment and the values were converted into hectare basis and expressed in quintals. The samples were first dried under shade and then in electric oven at a temperature of 60^0 C until attain constant weight. On the basis of these samples, the green fodder yield was converted into dry matter yield. The data of eight cuts in all the years were pooled and statistically analyzed for interpretation of results.

RESULTS AND DISCUSSION

Green Fodder Yield

Pooled data of three years indicated that Bajra Napier Hybrid variety BNH-10 recorded significantly higher green fodder yield (1431.41 q/ha) as compared to the local variety CO-3 (972.04 q/ha) and it was on par with variety PNB-233 (NC) (1337.71 t/ha) (Table 1). The Higher green fodder yield in BNH-10 was due to improved growth parameters like plant height, more number of tillers and leaf stem ratio. These results are in accordance with the findings of Yunus *et al.* (2000).

Dry Matter Yield

Pooled data of three years suggested that significantly higher dry matter yield (269.02 q/ha) was observed in Bajra Napier Hybrid variety BNH-10 when compared to local variety CO-3 (183.52 q/ha) which was on par with variety PNB-233 (NC) (260.88 t/ha) (Table 1). The higher dry matter yield in BNH-10 was due to higher green biomass yield, leaf-stem ratio and growth parameters like plant height. The results are in agreement with the findings of Wandera *et al.* (2000) and Vanlauwe (2004).

Plant Height

Pooled data of three years indicated that superior plant height (111.64 cm) was seen in Bajra Napier Hybrid variety BNH-10 when compared to the local variety CO-3 (80.39 cm) (Table 2) and was on par with variety PNB-233 (NC) (107.33 cm). The higher plant height was mainly attributed to more uptake of nutrient by crop which resulted in more vegetative growth. The findings of Zewdu *et al*. (2002) and Tessema *et al*. (2003) supported the above results.

Leaf-Stem Ratio

Pooled data of three years (Table 2) revealed that Bajra Napier Hybrid variety BNH-10 showed higher leaf-stem ratio (0.76) as compared to the local variety CO-3 (0.64) and it was on par with variety PNB-233 (NC) (0.72). Increase in leaf-stem ratio was mainly due to rapid expansion of dark green foliage, which could intercept and utilize the incident solar radiation in the production of photosynthates and eventually resulting

TABLE 1
Green forage yield and dry matter yield of Napier Bajra Hybrid varieties in southern dry zone of Karnataka

Entries	Green forage yield (q/ha)				Dry matter yield (q/ha)			
	2009	2010	2011	Pooled	2009	2010	2011	Pooled
BNH-10	1512.03	1578.05	1204.14	1431.41	302.41	297.71	206.93	269.02
NHN-9	1334.17	1263.88	776.36	1124.80	266.83	220.35	139.98	209.05
TNCN-07-3	1306.5	997.04	832.18	1045.24	261.30	188.93	145.30	198.51
BNH-3	1292.33	1164.06	853.72	1103.37	258.47	227.26	146.56	210.76
TNCN-07-4	1221.07	1276.63	930.98	1142.89	244.21	235.41	170.93	216.85
DHN-09	1011.67	1108.13	784.02	967.94	202.33	200.94	132.10	178.46
DHN-12	899.73	1135.96	787.49	941.06	179.95	207.79	141.19	176.31
TNCN-07-1	967.33	1018.13	735.66	907.04	193.47	197.90	123.25	171.54
TNCN-07-2	966.33	1068.47	792.04	942.28	193.27	203.36	139.36	178.66
CO-3 (NC)	1074.33	1056.97	784.81	972.04	214.87	203.49	132.21	183.52
PNB-233 (NC)	1599.27	1408.60	1005.25	1337.71	319.85	284.09	178.70	260.88
Mean	1198.62	1188.72	862.42	1083.25	239.723	224.29	150.59	204.87
S. Em±	38.674	44.96	53.83	45.82	5.513	13.06	13.25	10.61
C. D. (P=0.05)	114.071	132.61	158.79	135.16	16.262	38.53	39.09	31.29

TABLE 2
Plant height, leaf-stem ratio and crude protein yield of Napier Bajra Hybrid varieties in southern dry zone of Karnataka

Entries	Plant height (cm)				Leaf-stem ratio				Crude protein yield (q/ha)			
	2009	2010	2011	Pooled	2009	2010	2011	Pooled	2009	2010	2011	Pooled
BNH-10	143.2	46.60	145.13	111.64	0.52	0.89	0.86	0.76	19.86	25.96	9.42	18.41
NHN-9	75.5	40.13	126.86	80.83	0.95	0.49	0.66	0.7	19.86	16.60	5.92	14.13
TNCN-07-3	147.4	58.00	137.06	114.15	0.38	0.69	0.57	0.55	18.3	14.26	7.42	13.33
BNH-3	119.8	66.33	127.86	104.66	0.56	0.76	0.73	0.68	15.93	18.38	6.11	13.47
TNCN-07-4	93.1	40.53	88.86	74.163	0.46	0.64	0.54	0.55	17.10	25.12	9.22	17.15
DHN-09	115.1	40.80	121.46	92.45	0.49	0.47	0.73	0.56	13.33	18.81	6.66	12.93
DHN-12	117.3	38.53	109.66	88.50	0.50	0.64	0.48	0.54	11.80	16.88	7.77	12.15
TNCN-07-1	131.4	58.87	124.60	104.96	0.72	0.48	0.62	0.61	12.70	16.09	7.39	12.06
TNCN-07-2	136.6	48.00	126.00	103.53	0.64	0.86	0.50	0.67	13.47	12.83	5.17	10.49
CO-3 (NC)	84.2	38.93	118.03	80.39	0.86	0.52	0.55	0.64	15.95	15.29	6.28	12.51
PNB-233 (NC)	93.8	89.13	139.06	107.33	0.52	0.87	0.76	0.72	19.64	21.39	9.41	16.81
Mean	114.33	51.44	123.78	96.518	0.60	0.67	0.64	0.64	16.175	18.33	7.49	13.99
S. Em±	2.332	2.52	3.97	2.94	0.022	0.06	0.07	0.05	1.408	1.90	1.04	1.45
C. D. (P=0.05)	6.879	7.43	11.72	8.68	0.066	0.18	0.20	0.15	4.153	5.61	3.08	4.28

in higher meristematic activity and increased leaf-stem ratio of fodder sorghum. These results are in conformity with the findings of Gupta (1995).

Crude Protein Yield

Pooled data of three years (Table 2) suggested that, Bajra Napier Hybrid variety BNH-10 recorded higher crude protein yield (18.41 q/ha) as compared to the local variety CO-3 (12.51 q/ha) which was on par with variety TNCN-07-2 (17.15 t/ha). The higher crude protein yield in BNH-10 was due to increased photosynthetic activity leading to beneficial effects like cell division and elongation which resulted in more production and accumulation of photosynthates, leading to higher dry matter production which resulted in higher crude protein yield. These results are in accordance with the findings of Sood *et al.* (1995) and Wandera *et al.* (2000).

Based on the present study it can be inferred that Napier Bajra Hybrid variety BNH-10 recorded superior green forage yield (1431.4 q/ha), dry matter yield (269.02 q/ha), crude protein yield (18.41 q/ha) and growth parameters like plant height (111.64 cm), leaf-stem ratio (0.76) over local variety CO-3. So, it can be recommended for cultivation in southern dry zone of Karnataka.

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