

Evaluation of suitable Hybrid Napier Bajra varieties for Southern Agro Climatic Zone of Andhra Pradesh, India

P. Aruna^{1*}, B. Soumya², G. Bharathi¹, K. Ravi Chandra³ and C. Ramakrishna⁴

¹Scientist (Agronomy), Livestock Research Station, Palamaner,

Sri Venkateswara Veterinary University, Tirupati (Andhra Pradesh), India.

²Assistant Professor, Livestock Farm Complex, College of Veterinary Science, Korutla, Telangana, India.

¹Scientist & Head (AGB), Livestock Research Station, Palamaner,

Sri Venkateswara Veterinary University, Tirupati (Andhra Pradesh), India.

³Scientist (Agronomy), Livestock Research Station, Lam Guntur,

Sri Venkateswara Veterinary University, Tirupati (Andhra Pradesh), India.

⁴Assistant Professor, Livestock Farm Complex, College of Veterinary Science, Hyderabad, Telangana, India.

(Corresponding author: P. Aruna*)

(Received: 10 September 2024; Revised: 10 October 2024; Accepted: 10 November 2024; Published: 14 December 2024)

(Published by Research Trend)

ABSTRACT: The experiment was conducted during the *kharif* and *rabi* season of 2023 in Fodder Production Farm of Livestock Research Station, Palamaner, Andhra Pradesh to evaluate the suitable Hybrid Napier Bajra varieties for Southern Agro Climatic Zone of Andhra Pradesh. The experiment was laid out in complete randomized block design with six hybrid napier bajra varieties (CO (CN) 4, CO (BN) 5, BNH-10, Red Napier, Packchong-1, Hiramani) each replicated thrice. The study revealed that among these napier bajra hybrids, CO BN (5) and CO (CN)-4 varieties performed well in this region by recording higher values of growth parameters and as well as green fodder yield which were observed as Plant height (340.8 and 290.5 cm), Leaf Length (131.7 and 125.3 cm), Leaf Breadth (5.61 and 5.30 cm), Stem Girth (7.60 and 7.10 cm), Number of tillers Clump⁻¹ (29.27 and 30.10 No.), No. of leaves tiller⁻¹ (15.25 and 13.53 No.), Green forage Yield (380.1 and 372.5 tha⁻¹) with CO BN (5) and CO- (CN) 4 respectively.

Keywords: Hybrid Napier Bajra, Green Fodder, Evaluation, Yield, CO BN (5), CO (CN)-4.

INTRODUCTION

Andhra Pradesh dairy farmers are opting to grow the napier bajra hybrid owing to its deep root structure, rapid growth, multicut and remarkable yield in terms of both quality and quantity. Antony and Thomas (2014) stated that because of high yielding potential and superior quality napier bajra hybrid gained the popularity among the dairy farmers. Finding the location specific best high-yielding fodder variety is one method of addressing the enormous disparity between the supply and demand of green fodder. Pandey and Roy (2011) stated that among all fodder crops Napier Bajra hybrid is multicut perennal grass with profuse tillering and high tonnage of green fodder throughout the year. Soumya *et al.* (2024) revealed that among nine napier bajra hybrids CO (BN) 5 recorded significantly higher green fodder yield under northern zone of Telangana conditions. Dahipahle *et al.* (2015) recorded that BNH-10 napier bajra hybrid obtained the higher growth parameters, drymatter production, yield and crude protein than CO-3 variety in north konkan zone of Maharastra. The nutritional value, soil suitability, climatic adaptability, and genetic variability of the several napier bajra hybrids are distinct. In light of the aforementioned considerations, a study was

carried out to document the growth and yield characteristics of six napier bajra hybrids grown in southern agro-climatic zone of Andhra Pradesh.

MATERIALS AND METHODS

A field experiment was conducted during 2023 at Fodder Production Farm of Livestock Research Station, Palamaner, Andhra Pradesh to find out the suitable hybrid napier bajra varieties for southern Agro-climatic zone of Andhra Pradesh. The experimental site is situated at an elevation of 683 meters mean sea level at 13.2008° North longitude and 78.7440°E east latitude. The soil of experimental field was red loam with neutral soil PH (6.99), Medium status of available nitrogen (263 kg/ha), Phosphorus (28.69 kg/ha) and potassium (154 kg/ha). The experiment consisted of 06 varieties viz., CO-(CN)4, CO(BN)5, BNH-10, Red Napier, Packchong-1, Hiramani. The experiment laid in Complete Randomized Block design with three replications. The varieties were planted in month of July, year 2023 with common row spacing of 60 x 60 cm between plants. The farm yard manure applied uniformly at the rate of 20 tha⁻¹ before the four weeks of plantation. At planting time a basal dose of 60 kg nitrogen, 50 kg P₂O₅ and 40 kg K₂O per hectare applied uniformly for all experimental plots. The remaining 180

kg ha⁻¹ of nitrogen was applied equally after each cut at 30-40 days interval for enhancing vegetative growth of napier bajra hybrids. The irrigations were given in 10-15 days interval depends upon the evaporation demand and environmental conditions. Hand weeding performed at 10 and 30 days after planting. The first harvest was taken about 75 days after planting and subsequent cuts were taken at interval of 30-40 days. 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 tones. The data was statistically analyzed and results were interpreted.

Details of cultivars. CO (CN) 4- This is an interspecific hybrid between fodder pearl millet CO 8 and Napier grass FD461 and released during 2008 by Department of forage crops, Tamilnadu Agricultural University, Coimbatore. The variety has characteristics of higher number of tiller production, leaf stem ratio and soft stem with high palatability. The yield ranges between 350-400 t ha⁻¹.

CO (BN) 5- This is an interspecific hybrid between fodder pearl millet IP20594 and Napier grass FD 437 and released during 2012 by Department of forage crops, Tamilnadu Agricultural University, Coimbatore in the year 2012. CO (BN) 5 variety having the features of profuse tillering, more leaf stem ratio with high dry matter production. The yield ranges between 350- 400 t ha⁻¹.

BNH-10 – This variety released by BAIF, Urulikanchan during the year 2012 and the variety produces higher yield and suitable for all over India except hill zone.

Pakchong-1 – This variety developed in country of Thailand by Department of Livestock Development. It grows very fast more than 3m height within 60 days.

Australian Red Napier- This variety contain the dry matter 21.3% and crude protein 8-11%.

Hiramani Napier- This is a desi local variety and it gives the yield on par with other hybrid varieties and it produces more number of tillers with robust stem.

RESULTS AND DISCUSSION

A. Plant height

The tallest plants were produced in Pakchong-1 variety, which were on par with CO (BN) 5 variety. The next best plant height recorded in CO (CN) 4, Australian Red Napier and BNH-10. The shortest plant height was noticed in Hiramani Napier variety. These above results were in confirmation with the findings of Wangchuk *et al.* (2015).

B. No. of tillers/ Clump

The highest number of tillers were recorded in CO (BN) 5 variety, which was however, on par with CO (CN) 4 variety, which were significantly superior to all other varieties. In the order of descended observed with pakchong-1, Austalian Red Napier and BNH-10 varieties. Lower number of tillers per clump recorded in Hiramani Napier. This was mainly attributed by genotypic difference of napier bajra hybrid varieties. This is in confirmation of results represented by Soumya *et al.* (2024).

C. No. of Leaves per tiller

Number of leaves were found to be significantly differ in various napier bajra hybrids. The higher number of leaves were associated with CO(BN)5 variety, which was however, in parity with CO(CN)4 variety. Next lower orders of leaves were noticed in Packchong-1, Australian Red Napier, BNH-10 and Hiramani Napier. Similar results were reported by Ramya *et al.* (2017).

D. Fodder Yield

The highest green fodder yield obtained in CO(BN)5 variety, which was however comparable with CO(CN) 4 variety these are significantly superior to other varieties. Next best hybrids were Packchong-1, Austalian Red Napier and BNH-10. The lowest fodder yield was obtained from the Hiramani Napier. Fodder yield reflects the cumulative effect of growth parameters such as plant height, Number of tillers and no. of leaves. Similar results were also reported by Vijayakumar *et al.* (2009); Babu *et al.* (2014).

Table 1: Growth parameters, yield attributes and green fodder yield of Napier Bajra varieties.

Sr. No.	Variety	Plant height (cm)	Leaf Length (cm)	Leaf Breadth (cm)	Stem Girth (cm)	Number of tillers Clump ⁻¹	No. of leaves tiller ⁻¹	Green forage Yield (tha ⁻¹)
1.	CO (CN)4	315.5	125.3	5.30	7.10	29.27	13.53	372..5
2.	CO(BN)5	340.8	131.7	5.61	7.60	30.10	15.25	380.1
3.	BNH-10	267.3	99.4	2.65	5.13	18.10	9.46	280.2
4.	Australian Red Napier	290.5	111.9	4.18	6.15	18.78	11.21	320.6
5.	Pakchong-1	350.8	112.0	4.68	6.47	22.52	12.95	356.5
6.	Hiramani	246.5	85.2	3.67	6.88	14.35	9.40	265.6
	C.D. (P=0.05)	20.2	12.6	0.41	0.32	3.72	1.73	15.3
	S.E.(m)±	7.1	5.9	0.12	0.10	1.31	0.4	4.2

CONCLUSIONS

Based on above experiment results it was concluded that among six napier bajra varieties tested CO (BN)5 and CO (CN) 4 are suitable hybrids for better green fodder production throughout the year in Chittor district

which falls in Southeren Agro-Climatic Zone of Andhra Pradesh as these hybrids recorded significantly higher values of growth attributes and green forage yield compare to the other varieties. Hence cultivation of CO (BN) 5 and CO (CN)4 may be recommended for better green fodder production throughout the year in

Chittoor district which falls in Southern Agro -Climatic Zone of Andhra Pradesh, India.

FUTURE SCOPE

The napier bajra hybrids identified in this study *i.e.*, CO (BN)5 and CO (CN)4 can be exploited commercially to increase the year round availability of green fodder for sustainable livestock production in chittoor district of Andhra Pradesh, India.

Acknowledgement. Authors would like to thank Sri Venkateswara Veterinary University for providing facilities and Support to conduct the field experiment at Fodder Production Farm of Livestock Research Station, Palamaner, Chittoor District, Andhra Pradesh.

REFERENCES

- Antony, S., and Thomas, C. G. (2014). Nutritive quality of hybrid napier cultivars grown under rainfed ecosystem. *Journal of Tropical Agriculture*, 52(1), 90-93.
- Babu, C, Iyanar, K., and Kalamani, A. (2014). High green fodder yielding new grass varieties. *Electronic Journal of Plant Breeding*, 5, 220-229.
- Dahipahle, A. V., Bhagat, S. B., Shinde, B. D., Mahadkar, U. V. and Gangawane, S. B. (2015). Performance of Bajra Napier Hybrid Varieties in north Konkan Zone of Maharashtra. The XXIII International grassland congress (Sustainable use of Grassland Resources for forage production, Biodiversity and Environmental Protection) took place in New Delhi, India from November 20 through November 24.
- Pandey, S. H. and Roy, A. K. (2011). Forage crops varieties. IGFR, Jhansi. Pp.25-27.
- Ramya, S., Ramesh, V., Muralidharan, J. and Purushothaman (2017). Fodder yield and chemical composition of hybrid napier and multi-cut sorghum fodder at stages of cutting. *Indian Journal of small ruminants*, 23(2), 181-185.
- Soumya, B., Aruna, P., Vidya, B., Sridevi, B., Shirisha, R., Razia Sultana and Sushma, K. (2024). Performance of Napier Bajra Hybrids in Northern Zone of Telangana. *International Journal of Research in Agronomy*, SP-7(11), 438-440.
- Vijayakumar, G., Babu, C., Velayudham, K., and Raveendran, T. S. (2009). A high yielding cumbu napier hybrid grass CO (CN)- 4. *Madras Agric. J.*, 96 (7-12), 291-292.
- Wangchuk, K., Rai, K., Nirola, H., Dendup, C., and Mongar, D. (2015). Forage growth, yield and quality responses of Napier hybrid grass cultivars to three cutting intervals in the Himalayan foothills. *Tropical Grasslands-Forrajes Tropicales*, 3(3), 142-150.

How to cite this article: P. Aruna, B. Soumya, G. Bharathi, K. Ravi Chandra and C. Ramakrishna (2024). Evaluation of suitable Hybrid Napier Bajra varieties for Southern Agro Climatic Zone of Andhra Pradesh, India. *Biological Forum – An International Journal*, 16(12): 86-88.