

A comprehensive guide to sustainable year-round Napier bajra hybrid cultivation

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A round-the-year supply of green fodder is vital for ensuring optimal productivity and reproductive performance of livestock. To achieve this, cultivating perennial fodder crops capable of producing high green biomass throughout the year is essential. In this context, the Napier-Bajra hybrid (NB hybrid), a perennial fodder crop, emerges as an excellent choice for livestock farmers with assured irrigation facilities. This fodder crop is recognized for its high-quality herbage yield, which is both palatable and juicy, thus making it a preferred choice for livestock. The timely adoption of proper agronomic management practices plays a crucial role in sustaining green fodder yields of NB hybrid over time. Therefore, an attempt has been made to bring this comprehensive guide to provide farmers with information on the latest improved cultivars, NB hybrid-based cropping systems, and off-season management practices essential for successful NB cultivation throughout the year.

Keywords: Bajra, Fodder, Napier, Varieties

Green fodder, often overlooked amidst discussions on livestock management, holds a crucial role for ensuring the health, productivity, and sustainability of livestock farming. It makes up to 70% of total livestock input costs, and is a vital component of the balanced dairy ration, delivering essential nutrition, including minerals and vitamins. Insufficient supply of green fodder adversely impacts both the productivity and reproductive performances of dairy animals. Currently, the country experiences a net deficit of 30.6% in green fodder and 11.85% in dry fodder, with a projected net deficit of 13.20% for green fodder, and 18.43% for dry fodder by 2050 (IGFRI Bulletin, 2020). This forces us to explore various agro-techniques that ensure the availability of green fodder throughout the year.

The NB hybrid, also known as Sankar Napier or Elephant grass, plays a crucial role in sustainable agriculture and livestock farming. The NB hybrid is renowned for its abundant herbage yields,

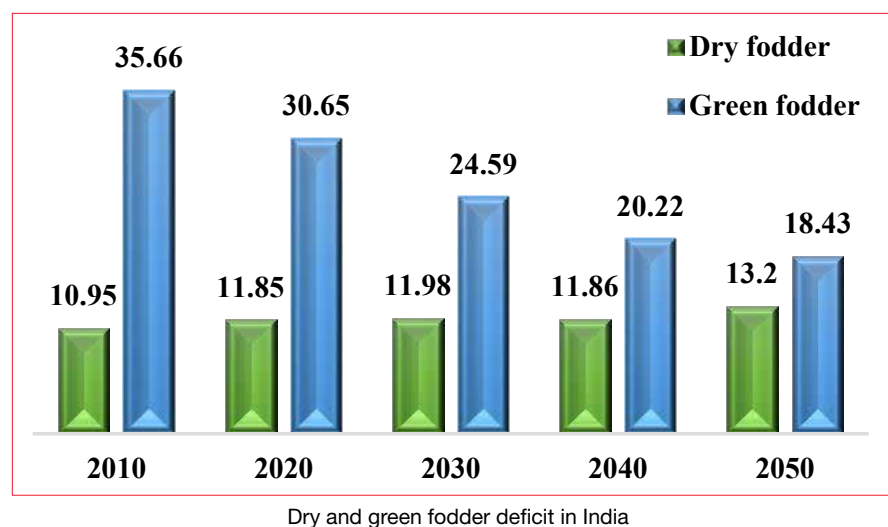
palatability and excellent fodder quality. It contains 8.7-10.2 % crude protein, 28-30.5% crude fibre, and 10-11.5% ash on a dry matter basis. It grows quickly, produces abundant herbage, and has sturdy stems. The grass is ideal for use as green fodder, silage, and hay.

Once planted, the NB hybrid can offer 8-10 cuts per year, and with proper management practices, it can provide green fodder for 5-6 years. The cost of production is nearly

half that of single-cut crops, and its output per unit area and time is approximately double (150-200 t/ha/year) that of conventional fodders. However, the adoption of appropriate agronomic management practices is essential to reap these benefits over a long period.

Agronomy of NB hybrid

It thrives well in areas with high temperatures and can withstand drought conditions for extended





NB hybrid grown at Fodder Farm, ICAR-IVRI

with rainfall. The best time of planting varies from mid-February to May under assured irrigation conditions, and from July to September during the rainy season. The major NB hybrid varieties developed in India are listed in Table 1, while a brief overview of the agronomic and production practices is provided in Table 2.



Propagating material (stem cuttings) of NB hybrid

NB hybrid-based cropping systems

Inclusion of intercrops in perennials like NB hybrid significantly boosts the green fodder production and optimizes the usage of resources such as space, water and nutrients. However, selecting the appropriate intercrops is a key factor for ensuring year-round green fodder production. Below are some promising NB-based cropping systems.

Off-season ploughing

Off-season ploughing is particularly important for perennial fodder crops like the NB hybrid for maintaining crop health, optimizing yields, and enhancing productivity. Consequently, farmers and growers often plan and schedule this operation according to the crop needs, growth stages, and environmental conditions to achieve optimum outcomes. It facilitates good soil aeration, effective weed control, better irrigation

periods. While it grows extremely well in areas with over 1,000 mm of rainfall, it cannot tolerate flooding or waterlogging. The optimum temperature for growth is 31°C, but it also performs well in regions with temperatures above 15°C. As a tropical grass, it can withstand short spells of moisture stress and high temperatures, regenerating

Table 1. Varieties suitable for different regions of India

Variety	Area of cultivation	Green fodder yield (t/ha)
IGFRI Hybrid Napier No. 3	North and Central Zone	70-100
PBN 233	North West regions	250-300
NB 21 and Pusa Giant	Whole Country	100-160
Giant King	North West India	350-450
CO-4, 5 & 6, 10	South and North West Zone	300-450
Yashwanth	Maharashtra	190-250
PBN 83	Punjab	125-170
APBN-1	Andhra Pradesh and whole Gujarat	260-295
Pant Selection 1	North zone	250-300
IGFRI 10	Whole country	300-350
Sampoorna (DHN 6)	Karnataka	120-150
Supriya	Kerala	250-300
TBN-20-15	India's first seed-producing Bajra-Napier hybrid, developed by ICAR-IGFRI, Jhansi	

Table 2. Package of practices

Preparatory cultivation	Plough 2 to 3 times to obtain a good tilth, and form ridges and furrows
Planting material	Two-budded stem cuttings or rooted slips (33,333 per ha)
Spacing	60 cm row-to-row, and 50 cm plant-to-plant
Manures and fertilizers	Basal: - Farm Yard Manure – 25 t/ha 2-3 weeks before planting - NPK –75 : 50 : 40 kg/ha Top dressing: 75 kg N/ha after 30 days of planting 75 kg N/ha after each cut Application of <i>Azospirillum</i> (2000 g) and <i>Phosphobacterium</i> (2000 g) or Azophos (4000 g) + 75% of recommended doses of N and P fertilizers can save 25% of fertilizer usage
Weed management	Hand weeding whenever necessary
Water management	Immediately after planting; life-saving irrigation on 3 rd day and thereafter once in every 10 days.
Harvesting schedule	First cut at 75-80 days after planting, and subsequent cuts every 45 days
Green fodder yield	360 - 400 t/ha/year (7 harvests)

Table 3. Promising cropping systems based on NB hybrid

Promising cropping systems	Green fodder (t/ha)
<i>North zone</i>	
Napier bajra hybrid + Velvet bean - Berseem + Mustard (Sub temperate, humid, red soil)	122
Napier bajra hybrid + Berseem (Semi-arid, alluvial soil)	211
Napier bajra hybrid + Lucerne (Semi-arid, black soil)	176
<i>Central and western region</i>	
Napier bajra hybrid + (Cowpea-Berseem) (Semi-arid, red soil)	255
Napier bajra hybrid + (Cowpea-Berseem) (Sub-humid, black soil)	176
<i>Eastern region</i>	
Napier bajra hybrid (Humid, acidic soil)	106
<i>Sothorn region</i>	
Napier bajra hybrid- Hedge lucerne	225

Source: Adapted from Forage Crops and Their Management, IGFRI, 2012



Off-season ploughing



Quartering technique being adopted in NB hybrid

management, and increased nutrient use efficiency.

Quartering

After two years of growth, Napier clumps become dense with large stools and dead tillers, resulting in sub-optimal performance and lower fodder yields. To restore

crop performance and enhance production efficiency, a thinning operation known as quartering should be performed in Napier. This process involves dividing the clump into four equal parts, separating three of the quarters from the main clump, while allowing the remaining clump to continue to grow.

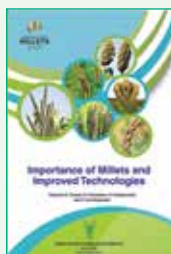
CONCLUSION

Overall, the NB hybrid offers a sustainable solution for fodder production by integrating the nutritional benefits of bajra and the agronomic advantages of Napier grass. Its high yield potential, nutritional value, and positive environmental impacts make it a valuable asset in modern agriculture and livestock farming. With appropriate agronomic management, including proper moisture level and nutrient management, farmers can certainly enjoy the benefits of NB hybrid for a decade once it is planted.

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