



# International Journal of Research in Agronomy

E-ISSN: 2618-0618

P-ISSN: 2618-060X

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2024; SP-7(3): 279-282

Received: 08-01-2024

Accepted: 16-02-2024

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## Mobilization of green fodder production through cultivation and feeding of super Napier: An action Research

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DOI: <https://doi.org/10.33545/2618060X.2024.v7.i3Sd.448>

### Abstract

An Action oriented approach to sensitize and mobilize the dairy farmers for intensive cultivation of super Napier fodder in Kalyana Karnataka region of Karnataka, India was conducted in Bidar district of Karnataka. This action research involved 10 respondents who reported that there was increase in quantity of milk after feeding the super Napier fodder to milch animals and there was no remarkable change in fat and SNF. Further, farmers felt that super Napier fodder was high yielding and required less time to grow in both first cut and subsequent cut, with less land and labour for same output compared to other fodder crops. Scarcity of water/ lack of irrigation facilities, low / non availability of cultivable land, lack of labour/ manpower, preference for cultivation of agriculture/cash crops were the major constraints in fodder production. The study concluded that there is a need to improve the knowledge level of farmers about fodder production and feeding of green fodder crops to dairy animals through various extension approaches for improved dairy production in the study area.

**Keywords:** Action research, super Napier, green fodder production, mobilization

### Introduction

Livestock sector is one of the most promising sectors in agriculture and is providing livelihood to majority of the households. Its importance is well acknowledged since, India has one of the largest livestock population in the world despite of around 35% deficit in green fodder and is leading in milk production globally (Singh *et al.*, 2022) <sup>[1]</sup>. Among various issues to be addressed in Indian dairy sector, fodder production and feeding has been a critical element for improved production and productivity. Green fodder crops are the cheapest source of feed for livestock. There is an urgent need to increase feed and fodder production potential to enhance milk production.

Since most commonly cultivated fodder crops like sorghum, maize, and berseem are seasonal in nature, they are unable to provide sufficient green fodder throughout the year. Therefore, it is necessary to adopt cultivation of such perennial fodder crops with a high potential yield (Malhi *et al.*, 2020) <sup>[7]</sup>. In this context, an effort was made to sensitize and mobilize the farmers towards cultivation of super Napier green fodder through action research. Further, the study also highlighted the impact and constraints of super Napier cultivation and feeding in the study area.

### Materials and Methods

The study was conducted in purposively selected three villages of Bidar district namely, Kattitugon, Byalahalli and Halahalli as they are nearer to Livestock Research and Information Centre (Deoni), Bidar. The researchers visited the related villages and interacted with the village leaders, key communicators, especially the secretaries of the village level Milk producers' co-operative societies (MPCS). It was followed by a formal meeting and training with the interested dairy farmers supported by field visit in LRIC (Deoni), Bidar. Mobilization is a process of assembling people and organizing and providing facilities like training and credit, to support objectives of the development programme.

A total of 25 interested farmers attended the meeting in which 10 farmers were identified finally for conducting action research in the study based on their socio-economic profile and prerequisites (Table 1). Care was taken that these farmers firstly had at-least quarter acre of irrigated land which they can dedicate for fodder cultivation and secondly, they had at-least two milking cows during the study period. These farmers were supplied with the super Napier stem cuttings. This super Napier fodder is high yielding variety and it is a cross of Napier grass (*Pennisetum purpureum*) and Pearl Millet (*Pennisetum glaucum*) which can yield more crude protein of about 16 to 18% (Kiyothong, 2014) [4]. Depending on the number of milking animals possessed and scientific production practices followed by the farmers, advisory services were provided to them. Then farmers were made to follow all scientific agronomical practices for cultivation of super Napier fodder. Efforts were made to compare the existing farmer's practices with super Napier feeding practices in the study area.

## Results and Discussion

### Socio-economic profile of livestock farmers

Table 1 shows that majority of the respondents had agriculture as a primary occupation and animal husbandry as secondary occupation with medium level of land holding and experience in animal husbandry, having small livestock units and high family income. Due to less cultivable land and lack of experience, farmers may not permit them to use the land for fodder production. Similar findings were reported by Rathod *et al.* (2012) [8] and Krupal *et al.* (2014) [5] who found that medium to high experience of livestock farmers was observed due to traditional occupation of middle and old age group.

### Prevailing feeding practices and production details

Analysis of table-2 found that majority of the respondents fed their animals with sugarcane tops, maize and available grass in the field with average of 16 kg per day per animal. With regards to dry fodder feeding practices, farmers fed sorghum and bajra straws (leftovers after grain harvest) along with other crop residues on an average of 4.25 kg per day per animal. Further, they feed Karnataka Milk Federation (KMF) commercially prepared concentrate feed while few farmers prepared and fed the mixture at the rate of 2 kg per day per animal. This might be since the respondents had lack of awareness in cultivation of high yielding and nutritious fodder varieties like super Napier, hedge lucerne and CoFs-31 etc. These findings are in

accordance with Rathod *et al.* (2017) [9] and Biradar and Vinod (2013) [1] who reported that crop leftovers, grazing and produced forage crops are some ways for livestock farmers to meet their needs for fodder sources.

### Super Napier cultivation and production

On analysis of table 3 it was found that average area allocated under fodder cultivation was 0.5375 acres and stem cuttings provided were 4,850 (for 0.53 acres). Average fodder yield at 1<sup>st</sup> cut (1sq.mt at 5 spots) after 84 days was 45.62 kg. Further, average fodder yield at 2<sup>nd</sup> cut (1sq.mt at 5 spots) was 51.09 kg after 41 days. The study showed that there is increase in fodder yield in second cut compared to the first cut. Super Napier fodder is considered as one of the best perennial crop with high productivity and is favourable for animal consumption due to its juicier stem and leaves. As the farmers are spending 70% of their dairy expenditure on feed and fodder of the animals, Napier bajra hybrid makes the most economical fodder (Liangco *et al.*, 2019) [6].

Table 1: Socio-economic profile of livestock farmers

Sl. No	Particulars	Frequency	Percentage (%)
<b>I</b>	<b>Occupation</b>		
	Agriculture (Primary)	10	100
	Animal husbandry (Secondary)	10	100
<b>II</b>	<b>Land holding (irrigated) in acres</b>		
	Small (0-3)	3	30
	Medium (3-5)	4	40
	Large (6-7)	3	30
<b>III</b>	<b>Land holding (Total) in acres</b>		
	Small (2-4)	2	20
	Medium (5-8)	6	60
	Large (9-11)	2	20
<b>IV</b>	<b>Experience in Animal Husbandry (years)</b>		
	Less (6-7)	4	40
	Medium (8-9)	5	50
	High (>=10)	1	10
<b>V</b>	<b>Livestock holding (Livestock units)</b>		
	Less (2-6)	7	70
	Medium (7-10)	2	20
	High (11-15)	1	10
<b>VI</b>	<b>Annual income (in Rupees)</b>		
	Low (<=2 Lakh)	3	30
	Medium (<3 Lakh)	3	30
	High (>=3 Lakh)	4	40

Table 2: Prevailing feeding practices and production details

Farmers No	Green fodder			Dry fodder			Concentrates			Grazing Yes/No
	Type	Quantity (In kgs)	Time	Type	Quantity (In kgs)	Time	Type	Quantity (In kgs)	Time	
1	Sugarcane/maize	16	2	Sorghum/bajra	4	2	KMF feed	2	2	No
2	Sugarcane/maize	15	2	Sorghum	5	2	0	0	0	Yes
3	Sugarcane	16	2	Crop residue	0	0	KMF feed	2	2	Yes
4	Sugarcane/maize	18	2	Crop residue	4	2	0	0	0	Yes
5	Sugarcane/grass	14	2	Crop residue	4	2	0	0	0	Yes
6	Sugarcane/maize	16	2	Sorghum	0	0	Feed mixture	2	2	No
7	Sugarcane/grass	15	2	Crop residue	3	2	0	0	0	Yes
8	Sugarcane/maize	16	2	Crop residue	5	2	Feed mixture	2	2	Yes
9	Sugarcane/grass	18	2	Crop residue	4	2	Feed mixture	2	2	Yes
10	Sugarcane/maize/grass	16	2	Sorghum/crop residue	5	2	KMF feed	2	2	Yes
	Average	16.00	2		4.25	2		2.00	2	8 (80.00%)

**Table 3:** Super Napier Cultivation and Production

Sl. no	Practices	Farmer details										Total	Average
		1	2	3	4	5	6	7	8	9	10		
1	Area used for SN (in acres)	1.25	0.25	0.50	0.38	0.50	0.50	0.25	0.50	0.75	0.50	5.38	0.5375
2	No of stems used	12000	2500	4500	3000	4500	4000	2000	6000	6000	4000	48500.00	4850
3	Date of sowing	04-07-2022	15-06-2022	13-07-2022	14-07-2022	18-07-2022	02-06-2022	13-07-2022	06-07-2022	19-06-2022	08-07-2022		
4	Date of 1 <sup>st</sup> cutting	29-09-2022	10-09-2022	03-10-2022	10-10-2022	12-10-2022	30-08-2022	10-10-2022	30-09-2022	10-09-2022	01-10-2022		
5	Fodder yield at 1 <sup>st</sup> cut (1sq.mt x 5 spots) (Kgs)	227	233	225	219	230	238	229	234	218	228	2281.00	45.62
6	Date of 2 <sup>nd</sup> cut	19-11-2022	28-10-2022	30-11-2022	05-12-2022	06-12-2022	16-10-2022	20-11-2022	25-11-2022	10-11-2022	20-11-2022		
7	Fodder yield at 2 <sup>nd</sup> cut (1sq.mt x 5 spots) (Kgs)	256.5	244.5	256	248	259.5	262	264.5	245.5	268.5	249.5	2554.50	51.09
8	Starting date SN feeding	29-09-2022	10-09-2022	03-10-2022	10-10-2022	12-10-2022	30-08-2022	10-10-2022	30-09-2022	10-09-2022	01-10-2022		

**Milk production before and after feeding super Napier**

Table-4 shows the production details of milch animals eight weeks before feeding super Napier followed by changes in production parameters after eight weeks of feeding the super Napier fodder. The study revealed that the average milk yield before and after feeding super Napier were  $6.02 \pm 0.10$  and  $6.35 \pm 0.11$ , respectively and it shows there is a significance difference in milk yield after feeding super Napier. Further, the

fat percentage of milk before and after were  $3.75 \pm 0.01$  and  $3.75 \pm 0.01$ , respectively and SNF percentage of milk before and after were  $8.5 \pm 0.00$  and  $8.5 \pm 0.00$ , respectively. The study shows that there is no significant difference in milk fat and SNF percentage after feeding the super Napier fodder. Results were in accordance with Dubey *et al.* (2018) [2] who reported that there is increase in milk yield by using the green fodder.

**Table 4:** Milk production before and after feeding super Napier

Trials (Mean±SE)	Milk yield (Per day)	p-value	Fat %	p-value	SNF %	p-value
Before	$6.02 \pm 0.10^*$	0.002	$3.75 \pm 0.01$	0.93	$8.5 \pm 0.00$	0.24
After	$6.35 \pm 0.11$		$3.75 \pm 0.01$		$8.5 \pm 0.00$	

\* < 0.05 p-value: Significant difference

Note: "Before"- Before feeding super Napier and "After"- After feeding super Napier fodder

**Farmer's perception about super Napier fodder**

The table 5 depicts the perception of farmers regarding super Napier fodder, which is high yielding, need less time to grow in both first cut and subsequent cut compared to other fodder crops, require less land and less labour for same output compared to other fodder crops, less requirement of fertilizer and farm yard manure. Further, the study also revealed that super Napier

fodder is very palatable which helps to increase quantity of milk production as major advantage of feeding super Napier. Further, farmers felt that super Napier fodder was suitable to their field conditions and some characters were similar to other non-leguminous fodder varieties and cultivation practices. The results were in accordance with Malhi *et al.*, (2020) [7].

**Table 5:** Farmer's perception on Super Napier fodder

Sl. No	Particulars	Yes	
		F	%
<b>I Relative Advantage</b>			
1	High yielding (more weight/ more stems/ more foliage)	10	100
2	Needs less time (90d 1 <sup>st</sup> cut, 60d subsequent cut)	10	100
3	Require less land for same output	10	100
4	Need less labour	10	100
5	Needs less water/ irrigation	5	50
6	Fertilizer requirement is less	10	100
7	FYM requirement is low	10	100
8	Cost of production is less	10	100
9	Palatable (more foliage/ juicy/ less thorns), livestock consume well	10	100
10	Quantity of milk production is improved	10	100
11	Quality of milk production is improved	3	30
<b>II Compatibility</b>			
1	Cultivation practices are similar to earlier. varieties	10	100
2	Suitable to agro-climatic conditions	10	100
3	Super Napier is similar to other non-leguminous fodder in use	5	50
<b>III Complexity</b>			
1	Easily understood the cultivation practices	10	100
2	Easily implemented the cultivation practices taught	10	100

IV	Trialability		
1	Tried the crop in small area	10	100
2	Production traits were observed in LRIC (Deoni) during field visit	10	100
V	Observability		
1	High yielding (more weight/ more stems/ more foliage)	10	100
2	Palatable (more foliage/ juicy/ less thorns), livestock consume well	10	100
3	Quantity of milk production is improved	10	100
4	Quality of milk production is improved	1	10

### Constraints in cultivation of super Napier fodder

Scarcity of water/lack of irrigation facilities, low/non availability of cultivable land, Lack of labour/manpower, preference for cultivation of agriculture/cash crops, erratic rainfall and lack of fencing/protection for the fodder crops were the major constraints in cultivation of super Napier fodder as perceived by respondents. Similar observations were reported by Rathod (2017)<sup>[10]</sup> and Javeed *et al.* (2020)<sup>[3]</sup> in the Bidar district of Karnataka.

### Conclusion and policy implications

The study concluded that farmers preferred to cultivate and feed super Napier fodder as it contributed to increase in milk yield of cows and that there is a need to focus on promotion of region-specific and palatable fodder varieties based on the field experience. Further, urgent efforts are needed to promote the farmers to cultivate high yielding perennial fodder crops for round the year fodder availability and to enhance the productivity of the animal.

### Acknowledgement

Authors are grateful to research farmers of Kalyana Karnataka region for sharing the information and their cooperation.

**Conflict of Interest:** None.

### References

- Biradar N, Vinod K. Analysis of fodder status in Karnataka. *Indian J Anim. Sci.* 2013;83(10):1078-1083.
- Dubey SK, Gautam US, Singh A, Singh A, Singh A. Empowering Cattle Keepers for On-Farm Production and Utilization of Green Fodder and Planting Materials: Hybrid (HB) Napier (*Pennisetum purpureum*) in Sitapur District of Uttar Pradesh. *Indian J Extens. Educ.* 2018;54(2):126-132.
- Javeed MA, Veeranna KC, Thirumalesh T, Rathod P, Gopala GT, Biradar C. Adoption of Green Fodder Production Practices in Watersheds of Bidar District, Karnataka. *Indian J Vet Sci. Biotechnol.* 2020;15(4):38-42.
- Kiyothong K. Manual for planting Napier pakchong 1. Nakhonrassima, Thailand: Department of Livestock Development, Thailand; c2014.
- Krunal DG, Nethravathi GV, Pandey OV. Profile analysis of dairy farm women in adoption of scientific practices. *Int. J Agric. Extens.* 2014;2(3):159-163.
- Liangco NC, Reyes JL, Gaffud OM, Pascua EM, Jamsawat V, Seatung C. Study on chemical composition of super Napier grass silage treated with *Lactobacillus Buchneri* and *Lactobacillus Plantarum*. *J Mycolc. Mycolc. Sci.* 2019;2(2):1-6.
- Malhi G, Sharma K, Kaur M, Gupta G. Bajra Napier Hybrid. An ideal crop for round the year green fodder production.
- Rathod PK, Landge S, Nikam TR, Vajreshwari S. Socio-personal profile and constraints of dairy farmers. *Karnataka J Agric. Sci.* 2012;24(4):619-620.
- Rathod P. Attitude of dairy farmers towards cultivation of green fodder crops in Bidar district of Karnataka. *Indian J Vet Sci Biotechnol.* 2017;12(03):152-156.
- Rathod P, Veeranna KC, Ramachandra B, Reddy D. Utilization of crop residues for livestock feeding: A field experience. In: XXVI Annual Conference of Society of Animal Physiologists of India (SAPI), p. 66-75.
- Singh DN, Bohra JS, Tyagi V, Singh T, Banjara TR, Gupta G. A review of India's fodder production status and opportunities. *Grass Forage Sci.* 2022;77(1):1-10.