The Pharma Innovation Journal 2023; 12(3): 2072-2074

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(3): 2072-2074

www.thepharmajournal.com
Received: 11-01-2023
Accepted: 10-02-2023

Sunitha NH
Agricultural Extension Education Centre, Huvinahadagali, Karnataka, India

Manjunatha Bhanuvally
Agricultural Extension Education Centre, Huvinahadagali, Karnataka, India

CM Kalibavi
Agricultural Extension Education Centre, Huvinahadagali, Karnataka, India

Corresponding Author:
Sunitha NH
Agricultural Extension Education Centre, Huvinahadagali, Karnataka, India

Popularization of white finger millet through Frontline demonstration in Vijayanagar district of Karnataka, India: A case study

Sunitha NH, Manjunatha Bhanuvally and CM Kalibavi

Abstract
A Frontline demonstration was carried out by Agricultural extension education Centre Huvinahadagali from 2019 to 2022 during *Rabi* seasons to demonstrate and popularize the potential of the white finger millet in farmer's fields of Vijayanagar district Karnataka. White-grained ragi variety (KMR 340 finger millet variety) was procured from the National Seeds Projects, University of Agricultural Sciences, Bangalore certified by Karnataka State Seeds and Organic Certification Agency. Results of the study clearly elucidated that the average yield of finger millet showed 25.35 to 41.25 per cent grain yield and 19.69 to 33.27 per cent fodder yield. The average technological gap for grain yield in finger millet ranged from 3.44 to 4.64 qtl/ha over the five years while fodder yield varied from 5.18 to 6.80 qtl/ha. Economic analysis the highest gross returns with 35471.58 Rs./ha, net returns with 23849.48 Rs./ha and B:C ratio with 1.83 and 1.79 respectively. The results of the study concluded that the grain yield of white finger millet as well as fodder yield under improved practices was higher than the farmer's practices. Which helped the farmers to gain higher yield and as well as increased the farmers income.

Keywords: Frontline demonstration, grain yield, fodder yield, economic analysis, technology index

Introduction

Finger millet *(Eleusine coracana* L. Gaertn*)* also called as Ragi is one of the most important millets grown extensively in Vijayanagar District. It is a very hardy crop, heat and draught resistant and can be grown in degraded soils. The small millets are smaller in size, they nutritious crops, through one panicle they can produce thousands of grains. These small millets include six crops viz., Finger millet (Eleusine coracana), Foxtail millet (Setaria italica), Kodo millet (Paspalum scrobiculatum), Proso millet (Panicum miliaceum), Japanese barnyard millet (Echinochloa frumentacea) and little millet (Panicum sumatrense). Finger millet is the one of the principal food grain in our India. In India especially in south India rural population use finger millet as their staple food. Millets are very rich source of calcium and dietary fibre (Vennila *et al.*, 2020) [11].

Among small millets, white finger millet is one of the most nutritious crop, which contains about 9% of moisture, 1.2 % fibre, 1.51.65% of fat, 11.98g protein, 1–2% ether extract, 69.37g carbohydrates, 4.20g dietary fibre and 340.25K cal of energy (Ravishankar *et al.*, 2019).

Among all the millets ragi provide highest level of calcium, antioxidants and phytochemicals. With respect to the dietary fibre ragi provide highest level of total dietary fibre which helps to control the blood glucose levels in diabetic patients. In rural area ragi is usually converted to flour form and can be used in preparations of many recipes. The higher fibre content of it helps to prevent constipation, high cholesterol and intestinal cancer. Hence, the people who suffering from diabetes they can usually advised to eat ragi instead of white rice.Thus there is a heavy demand for ragi due to its health benefits.

In India traditionally it is been used in the form of flour, preparing mudde, roti, ganji, ragi alwa, ragi laddu. However the colour of the ragi has been the major drawback for its acceptability by children and adults. With this preview a thought on white finger millet has arisen and white finger millet was released by University of Agricultural Sciences, Bangalore in the year 2012 (Ravishankar *et al.*, 2019). Among both brown and white grain types, white grain types are preferred because of their high protein, low fibre, low tannins and higher consumer acceptability (Sharathbabu *et al.*, 2008) [7].

Materials and Methods

A Frontline demonstration was carried out by Agricultural extension education Centre Huvinahadagali from 2019 to 2022 during *Rabi* seasons to demonstrate the potential of the white finger millet in farmers fields of Vijayanagar district Karnataka. White-grained ragi variety (KMR 340 finger millet variety) was procured from the National Seeds Projects, University of Agricultural Sciences, Bangalore certified by Karnataka State Seeds and Organic Certification Agency.

Before implementing FLD's meetings were carried out with farmers, a survey was under taken for selection of the farmers and villages. After the selection of the farmers the orientation training programme was imparted to the beneficiaries related to crop. A total of 50 farmers were selected for frontline demonstrations in Vijayanagar district of which 2000ha land was covered by high yielding finger millet during the five years. The quality seeds of finger millet variety KMR-340 were distributed to the selected farmers under FLDs.

During the FLDs monitoring was carried from sowing to harvesting period. Farmers were oriented to adopt package of practices, timely sowing, effective plant protection and weed management in both the practices (farmer's practice and improved practice). The average yield of each FLD and farmer's practice, cost of cultivation, gross return, net return and benefit cost ratio (B:C ratio) was taken for subsequent five years for interpretation of the results. The extension gap, technology gap and technology index were calculated using the following formula as suggested by Samui *et al.*

$$\text{Technology index} = \frac{\text{Potential yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

$$\text{Technology gap} = \text{Potential yield} - \text{Demonstration yield}$$

$$\text{Extension gap} = \text{Demonstration yield} - \text{Yield under farmer's practices}$$

$$\text{B:C ratio} = \frac{\text{Net income (Rs./ha)}}{\text{Cost of cultivation (Rs./ha)}}$$

$$\text{\% increase over farmer's practices} = \frac{\text{Improved practices} - \text{Farmer's practices}}{\text{Farmer's practice}} \times 100$$

Results

Grain and fodder yield

Results clearly elucidated that the average yield of finger millet showed 25.35 to 41.25 per cent grain yield and 19.69 to 33.27 per cent fodder yield. Similar results were indicated by Rawat *et al.*, (2019) [5] and Thakur *et al.* (2017) [10] that the finger millet showed 26.75 to 32.65 percent grain yield and 23.18 to 29.27 percent fodder yield and 53.5 to 61.3 per cent higher yield respectively.

Table 1: Impact of improved and farmers practices on grain yield of white finger millet under frontline demonstrations

Years	Area (ha)	No. of FLD	Grain yield (qtl/ha)			Fodder yield (qtl/ha)			Grain yield			Fodder yield		
			IP	FP	%	IP	FP	%	TG (qtl/ha)	EG (qtl/ha)	TI (qtl/ha)	TG (qtl/ha)	EG (qtl/ha)	TI (qtl/ha)
2018	4	10	16.32	12.52	30.35	28.20	21.16	33.27	3.68	3.80	18.40	6.8	7.04	19.42
2019	4	10	15.36	11.68	31.50	29.35	22.42	30.90	4.64	3.68	23.20	5.65	6.93	16.14
2020	4	10	16.56	13.21	25.35	28.56	23.86	19.69	3.44	3.35	17.20	6.44	4.70	18.40
2021	4	10	15.82	11.20	41.25	28.34	23.18	22.26	4.18	4.62	20.90	6.66	5.16	19.02
2022	4	10	16.51	12.84	28.58	29.82	22.49	32.59	3.49	3.61	17.45	5.18	7.33	14.80

I.P. = Improved Practices, F.P. = Farmers' Practices, T.G. = Technology Gap, E.G. = Extension Gap and T.I. = Technology Index

Table 2: Economic analysis of white finger millet under frontline demonstration

Year	Area (ha)	No of FLD's	Gross returns Rs/ha		Net returns Rs./ha		B:C ratio	
			I.P.	F.P.	I.P.	F.P.	I.P.	F.P.
2018	4	10	35241.55	29258.29	22549.25	19645.75	1.82	1.61
2019	4	10	34562.24	30759.45	23589.57	18956.21	1.78	1.59
2020	4	10	35465.27	31754.48	23849.48	19654.78	1.79	1.68
2021	4	10	34586.39	30965.94	22654.91	18942.65	1.85	1.69
2022	4	10	35471.58	29486.84	23644.47	18942.57	1.83	1.64

I.P. = Improved Practices, F.I. = Farmers' Practices

Technology gap

The average technological gap for grain yield in finger millet ranged from 3.44 to 4.64 qtl/ha over the five years while fodder yield varied from 5.18 to 6.80 qtl/ha (Table 1). The higher technological gap may be attributed mainly due to the uneven distribution of rainfall, variations in soil fertility and cultivation on marginal lands and local specific crop management problems faced in order to harness the yield potential of specific crop cultivars under demonstration plots. Similar results were reported by Rawat *et al.*, (2019) [5] that the average technology gap of finger millet was 5.63 to 7.81 qtl/ha. And the same trend was observed by Thakur *et al.*, (2017) [10] that 9.91 qtl/ha for finger millet.

Extension gap

With respect to the extension gap the average extension grain yield gap for finger millet was calculated 3.35 to 4.62 qtl/ha over five years. However, fodder yield showed higher extension yield gap varied from 5.16 to 7.33 qtl/ha in finger millet. The higher extension yield gap due to lack of awareness for the adoption of improved farm technologies by the farmers indicating that there is a strong need to aware and motivate the farmers for adoption of improved farm technologies in finger millet and barnyard millet over existing local practices. Similar results reported by Sunitha *et al.*, (2020) [2, 3, 4] that the average extension grain yield gap for foxtail millet was calculated 5.14 qtl/ha over five years.

Adoption of improved practices increased the yield of finger millet to the tune of 21.7 per cent compared to the farmers practice under rainfed condition. The increased yield under demonstration might be due to the combined effect of high yielding, drought tolerant variety and adoption of improved crop management practices. The similar results through front line demonstration of improved technologies for yield enhancement was reported by Kumar *et al.*, (2010) [1] in bajra; Solanki *et al.*, (2014) [8, 9] in maize.

Technology index

The technology index calculated for finger millet showed higher value that ranged from 17.20 to 23.20per cent for grain yield five years under rainfed conditions. The technological index varied between 23.50 to 32.15 in sunflower quoted by Sunitha *et al.*, (2020) [2, 3, 4]. This mjght be attributed to soil fertility condition which is very dissimilar in condition, pests attack, non availability water source and climatic condition.

Economics analysis

With regard to the economic analysis the highest gross returns with 35471.58 Rs./ha, net returns with 23849.48 Rs./ha and B:C ratio with 1.83 and 1.79 respectively. were calculated under improved practices while under farmers' practices highest gross returns with 31754.48 Rs./ha, net returns with 19654Rs./ha and B:C ratio with 1.68 were observed across the years for barnyard millet (Table 2). Sunitha *et al.*, (2020) [2, 3, 4] observed that the benefit: cost ratio (B:C) was 1.55, 1.45, 1.20 & 1.04 pigeon pea, greengram, bengalgram and cowpea respectively in demonstrated plots. The benefit: cost ratio (IBCR) of 1.30, 1.28, 1.11 & 1.01 in pigeon pea, greengram, bengalgram and cowpea, respectively in farmer's fields.

Conclusion

The results of the study concluded that the grain yield of white finger millet as well as fodder yield under improved practices was higher than the farmer's practices. Which helped the farmers to gain higher yield and as well as increased the farmers income. The white finger helped to enhance the farmer's income and also increased the acceptability of white finger millet. Farmers also expressed their views about the acceptability and adaptability of the crop.

However, a wide gap in potential yields, demonstration yields and farmers plot yields due to technological and extension gaps indicating that there is a need of proper dissemination of location specific technologies imbedded with high yielding varieties to improve productivity and profitability in finger millet.

References

1. Kumar A, Kumar R, Yadav VPS, Kumar RA, Impact assessment of frontline demonstrations of bajra in Haryana state. Indian Research Journal of Extension Education. 2010;10(1):105-108.
2. Sunitha NH, Hanumanthppa Shrihari, Manjunath Banuvally. An impact assessment of front line demonstrations on yield and economics of foxtail millet under rainfed conditions of Hadagali Taluka. International Journal of Current Microbiology and applied sciences. 2020;9(1):2216-2223.
3. Sunitha NH, Hanumanthppa Shrihari, Manjunatha Bhanuvally, Kalibavi CM. Frontline demonstration: An effective tool for increasing productivity of pulses. International Journal of Chemical Studies. 2020;SP-8(4):445-447.
4. Sunitha NH, Hanumanthppa Shrihari, Manjunatha Bhanuvally, Kalibavi CM. Yield gap analysis in sunflower (Helianthus annuus L.) through front line demonstrations in Bellary District of Karnataka. Journal of Pharmacognosy and Phytochemistry. 2020;SP6:324-327.
5. Rawat L, Prasad S, Bisht TS, Naithani DC, Ankit T, An impact assessment of front line demonstrations on yield and economics of finger millet and barnyard millet under rainfed conditions of Uttarakhand. Int. J Pure App. Biosci. 2019;7(2):408-414.
6. Samui SK, Mitra S, Roy DK, Mandal AK, Saha D, Evaluation of front line demonstration on groundnut. J Indian Soc. Coastal Agric. Res. 2000;18(2):180-183
7. Sharathbabu, Sonnad SK, Santhakumar G, Salimath PM. Genotype environment interaction effect on seed yield and its component characters in white ragi *(Eleusine coracana* Gaertn). Karnataka Journal of Agricultural Sciences. 2008;21(2):190-193.
8. Solanki RL, Rathore RS, Dhakar SD, Ka-nojia Y. Yield gap analysis of integrated nu-trient management in maize through front line demonstration. International Journal of Plant Sciences. 2014;9(2):438- 440.
9. Solanki RL, Rathore RS, Dhakar SD, Kanojia Y. Yield gap analysis of integrated nutrient management in maize through front line demonstration. International Journal of Plant Sciences. 2014;9(2):438-440.
10. Thakur AK, Kumar P, Yadav SC. Impact of front line demonstration (FLD) on the yield and economics of small millet on Bastar District of Chhattisgarh, India. International Journal of Current Microbiology and applied sciences. 2017;6(9):1489-1497.
11. Vennila MA, Sangeetha M, Thangadurai R, Shanmugam PS. Impact of frontline demonstrations on finger millet in tribal areas of Dharmapuri District of Tamil Nadu, India. International Journal of Current Microbiology and applied sciences. 2020;9(8):1404-1409.