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Demonstration of salt tolerant paddy variety GNV-1109 for enhancing productivity in saline soils

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Abstract

ICAR-Krishi Vigyan Kendra, Koppal, has conducted frontline demonstrations on salt tolerant paddy variety GNV-1109 for higher productivity under saline soils in Gangavathi blocks of Koppal District (Karnataka) during *kharif* 2022-23 and 2023-24 to demonstrate production potential and economic benefits of improved production technologies comprising salt tolerant variety GNV-1109 were compared with check variety (BPT-5204). The demonstrated variety (GNV-1109) observed 31.63 percent higher grain yield as compared to check variety. The extension gap, technology gap and technology index were 17.36 q ha^{-1}, 2.77 q ha^{-1} and 3.69 percent, respectively. Further, demonstrated variety observed higher gross return (Rs. 1,51,599 ha^{-1}), net return (Rs. 83,804 ha^{-1}) and higher B:C (2.21) as compared to check variety. Therefore, GNV-1109 variety was suitable under saline soil conditions in Koppal district of Karnataka state.

Keywords: Paddy, GNV-1109, yield, income, yield gap analysis

Introduction

Rice is the most important food crop of India covering about one-fourth of the total cropped area and providing food to about half of the Indian population. This is the staple food of the people living in the eastern and the southern parts of the country. In Karnataka state rice is grown over an area of 1.50 million hectare with an annual production of about 3.71 million tonnes with an average productivity of 2540 kg per hectare (Anon, 2021) [1].

Salinity largely reduces the yield of rice in India. Salinity in arable land is mainly caused by the excessive use of irrigation water with improper drainage, poor quality irrigation water containing an excess level of salts, and flooding from seawater (Ismail *et al.*, 2007) [4]. The low productivity of paddy crop is due to poor adoption of improved technologies of paddy by the farmers.

Therefore, Krishi Vigyan Kendra, Gangavathi (Koppal) has organized frontline demonstrations (FLD's) with improved salt tolerant variety along with recommended package of practices. The main purpose of these demonstrations was to enhance the production which in turn will increase the income levels of farmers and to transfer the latest production technologies to farmers in the district. In Koppal district, increased soil salinity (4-10 dS/m) in TBP command area from 20,000 ha to 96,000 ha, yield reduction by 15-20 percent (20-23 q/ha) and existing variety BPT 5204 is long duration (150-155 days) and less salt tolerant (<4dS/m) variety. Taking into account the above considerations, frontline demonstrations (FLDs) were carried out in a systematic manner on farmer's field to show the worth of a new salt tolerant variety and convincing farmers to adopt improved production management practices of paddy for enhancing productivity.

Materials and Methods

ICAR-Krishi Vigyan Kendra, Koppal (Gangavathi) was conducted front line demonstration during *kharif* 2022-23 and 2023-24 at different farmer's field in Gangavathi blocks of Koppal district. The demonstrated technology of paddy salt tolerant variety GNV-1109 was compared with BPT-5204 (check variety). Seed treatment with *Azospirillum* and PSB each @ 200 g/acre, carbendazim @ 2g/kg seed and modified dosage of fertilizer @ 80:40:40 kg NPK/acre. Special features of GNV-1109 are, salt tolerant up to 10 $dSm^{-1}$and tolerant to blast disease, 130-135 days duration, long bold grains, suitable for *Kharif* season and yield level up to 75 q/ha. The agronomic practices were same followed in demonstrated and farmer practices in front line demonstration during both the seasons in ten farmer's field. The yield data collected from demonstrated plot and farmers practices at the time of harvest. Further, extension gap, technological gap, technological index along with the benefit-cost ratio were calculated. The demonstration of paddy salt tolerant varieties in the field is shown as in Fig 1.

Fig 1: The demonstration of paddy varieties in the field

Results and Discussion

The results of present investigation, the pooled results indicated that, grain yield of paddy from both the plots *i.e.*, demonstration and farmers' practices were compared and an average yield of demonstrated plots was 31.63 percent higher than that of check variety (Table 1). The results were observed that grain yield under demonstrated plots were 70.40 and 74.06 q ha^{-1} with an average of 72.23 q ha^{-1} from the year 2022-23 and 2023-24. However, it was 56.50 and 53.75 q ha^{-1} with an average of 54.87 q ha^{-1} under check variety. The higher yield under demonstrated plots might be due to growth and yield performance of GNV-1109 and which ultimately increased the yield. The similar results were reported by (Samant, 2017) [8]. Similar findings were found by Geeta *et al*., (2017) [3] who reported that frontline demonstration with improved practices led to higher yields in rice.

Extension Gap

The higher extension gap (20.81 q ha^{-1}) was observed during 2022-23 and lower (13.09 q ha^{-1}) was in 2023-24 (Table 1) which may be due to higher yield of rice variety in demonstration plots. More and more use of latest production technologies with high yielding salt tolerant variety will subsequently change this alarming trend of galloping extension gap. The new improved technologies will eventually lead to the farmers to discontinue the old varieties and to adopt new variety. Similar results were reported by Sharma *et al.*, (2011) [9].

Technology Gap and Index

The pooled results of technology gap was observed 2.77 q ha^{-1}. The demonstrations in both the year recorded technology gap of 4.60 q ha^{-1} during 2022-23 and 0.94 q ha^{-1} in 2023-24. Technology gap indicate the needs to create awareness among the farmers through various extension activities. The Technology index was reduced from 6.13 to 1.25% during 2022 to 2023 (Table 1) which showed the higher feasibility of the demonstrated technology of salt tolerant GNV-1109 in farmers field. This finding was in corroboration with the findings of Sujathamma *et al.,* (2015) [10].

Economics of paddy cultivation

The demonstrated variety, GNV-1109 was observed higher gross return (Rs. 151599 ha^{-1}), net return (Rs. 83804 ha^{-1}) and benefit cost ratio (2.21) on overage of both the years as compared to check variety (BPT-5204) (Table 2). Higher net returns which might be due to higher grain yield. The similar results were also reported by (Daniela *et al.*, 2017) [2] and Mubark and Shakoor (2019) [7] also obtained maximum gross returns, net returns and B: C ratio in FLDs with improved technologies in rice. Madanmohan *et al*., (2021) [6] and Jayalakshmi *et al*., (2021) [5] observed higher gross returns, net returns and benefit-cost ratio in demonstrations as compared to farmer's practice.

Table 1: Grain yield and Gap analysis in demonstrated and farmer's practices

Years	Grain yield (q/ha)		% increase	Extension gap (q/ha)	Technology gap (q/ha)	Technology index (%)
	Demonstration	Farmers practices				
2022	70.40	56.50	24.60	13.9	4.6	6.13
2023	74.06	53.25	39.08	20.81	0.94	1.25
Average	72.23	54.87	31.63	17.36	2.77	3.69

Table 2: Economic analysis in demonstrated and farmer's practices

Years	Gross returns (Rs/ha)		Net returns (Rs/ha)		Benefit cost ratio	
	Demonstration plots	Farmers practices	Demonstration plots	Farmers practices	Demonstration plots	Farmers practices
2022	140800	124300	74300	54400	2.11	1.75
2023	162398	149100	93308	63875	2.32	1.75
Average	151599	136700	83804	59137	2.21	1.75

Conclusion

The pooled results concluded that, demonstrated technology of improved salt tolerant variety of GNV-1109 was found higher productivity and income as well as the livelihood of the farming community. Thus, under sustainable agricultural practices, FLD programmes are very effective in educating the farmers in adoption of improved technologies like variety.

References

1. Anonymous. Annual report on rice production; c2021.
2. Daniela R, Carrijo, Lundy ME, Linquist BA. Rice yields and water use under alternate wetting and drying irrigation: A meta-analysis. Field Crop Res. 2017;203(1):173-180.
3. Geeta RC, Sunil GP, Kacha DJ. Popularization of improved variety of rice mahisagar through frontline demonstrations in Gujarat. Gujarat J Extension Educ. 2017;8(1):109-111.
4. Ismail AM, Heuer S, Thomson MJ, Wissuwa M. Genetic and genomic approaches to develop rice germplasm for problem soils. Plant Mol Biol. 2007;65:547-570.
5. Jayalakshmi M, Prasadbabu G, Chaithanya BH, Bindhupraveena R, Srinivas T. Impact of soil test based fertilizer application on yield, soil health and economics in rice. Indian J Extension Educ. 2021;57(4):147-149.
6. Madanmohan M, Ramalakshmi Devi S, Srinivasulu DV, Veeraiah A. Performance assessment of cluster frontline demonstrations in chickpea (*Cicer arietinum* L.) for productivity enhancement under rainfed vertisols of YSR District Andhra Pradesh. Agric Sci Digest. 2021;41(1):66-70.
7. Mubark T, Shakoor A. Impact assessment of technological interventions for reducing yield gaps in rice (*Oryza sativa* L.) under temperate hill ecology. J Krishi Vigyan. 2009;7(2):140-143.
8. Samant. Evaluation of Front Line Demonstration on Drought Tolerant Rice (*Oryza sativa* L.) Variety Satyabhama in Mid Central Table Land Zone of Odisha. Int J Bio-resource Stress Manage. 2017;8(6):871-876.
9. Sharma P, Khar S, Kumar S, Ishar A, Prakash S, Mahajan V. Economic impact of front-line demonstrations on cereals in Poonch district of Jammu and Kashmir. J Progressive Agric. 2011;2:21-22.
10. Sujathamma P, Reddy KD, Usharani G. Yield gap analysis if rice for technological intervention. The Ecoscan. 2015;9(1&2):235-237.