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Impact of Cluster Front Line Demonstration in Black Gram at Pudukkottai District of Tamil Nadu

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: India is the largest importer, producer, and consumer of pulses in the world. In order to protect indigenous pulse production, India must not only produce enough pulses, but also remain competitive. It was recommended that extension agencies involved in the transfer and application of agricultural technologies to farmers' fields prioritise organising frontline demonstrations on a cluster basis to maximize pulse crop productivity.
Study Design: Expost-facto study.
Place and Duration of Study: The study was conducted among farmers from Pudukkottai district which covered under KVK, Vamban. The demonstration period was 2016 – 2019.
Methodology: By simple random sampling technique, 30 farmers were selected and VBN 6 variety was demonstrated in the area of 6 ha.
Results: The maximum yield was 9.74 qtl/ha and average yield was 9.48 qtl/ha. The yield gap minimized was 0.2%. The B.C ratio was 4.06 which indicated the profit level.

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Conclusion: The study concluded that VBN 6 in recommended practice proved beneficial in respect of yield and economics of blackgram.

Keywords: Black gram; VBN 6; demonstration; yield; cluster front line; KVK; Pudukkottai.

1. INTRODUCTION

"Pulses are important sources of vegetable protein and play an important role in nutritional security. India is the world's largest producer of pulses, yet it imports a significant amount to meet domestic demand. India is the largest importer, producer, and consumer of pulses in the world. In order to protect indigenous pulse production, India must not only produce enough pulses, but also remain competitive. Black gram has 22-24% protein, which is nearly twice that of wheat and three times that of rice. Pulses have been proven to have significant nutritional and health benefits, as well as a reduced risk of non communicable diseases such as colon cancer and cardiovascular disease" [1]. "The poor yield of black gram is mainly attributed to the use of poor quality seeds, water stress, no fertilizer application, no YMV management and no weed management" [2,3]. Low productivity can also be linked to peoples' refusal to adopt improved production technology, which includes agronomic methods and socio economic situations. The productivity of black gram in the district can be increased by following the appropriate agronomic practices along with high yield black gram varieties. As a result, it was recommended that extension agencies involved in the transfer and application of agricultural technologies to farmers' fields prioritise organising frontline demonstrations on a cluster basis to maximize pulse crop productivity, close the technology gap, increase technology adoption, and reduce disease and insect infestation. The TNAU Black gram VBN 6, the parentage was Vamban 1 x Vigna mungosilvestris. The duration of the crop is *65-70* days. The yield under irrigated condition is 890 Kg/ha. The pods are hairy in nature and the variety is resistant to Yellow Mosaic and it has synchronized pod maturity.

2. METHODOLOGY

Frontline demonstrations were conducted by the Krishi Vigyan Kendra, Vamban in the farmer's fields of Pudukkottai district during 2016-19. All demonstrations in 6 ha area were conducted by the active participation of farmers with the objective to demonstrate the improved technologies of black gram production potential in different villages. A total area of 6 hectare in every year was fixed for the demonstration of technologies in Black along with farmers practice as control plot. Pre-sowing trainings were organized involving the selected farmers in their village for the crops. Critical inputs for the technologies to be demonstrated were distributed to the farmers after the training like improved high yielding variety, recommended chemicals and literature and regular visit, monitoring and pest and disease advisory services management by the KVK scientist to the demo farmers. The most feasible way by which this could be achieved is by demonstrating the recommended improved technology on the farmer's fields through front line demonstrations with the objectives to work out the input cost and monetary returns between front line demonstration and farmers methods, to identify the yield gaps between farmers' practices and front line demonstrations. The data were collected from both CFLD plots as well as control plots and finally the extension gap, technology gap, technology index along with the benefit cost ratio were worked out [4] as given below.

Technology gap= Potential yield - Demonstration yield

Extension gap= Demonstration yield - Farmer's yield

Technology index = Potential yield − Demo. yield / Potential yield

3. RESULTS AND DISCUSSION

The VBN 6 seeds were distributed to the farmers which costs about Rs.7200 for sowing purpose. The other inputs such as Vermicompost, Pulse wonder for flowering, Pendimethaline for herbicide and bioagents such as Pheramone trap and Pheramone lure was used in the field (Table 1).

3.1 Performance of the Demonstration

The existing farmers' variety was VBN 5. The yield of this variety was 8.25 qtls/ha. The yield gap with respect to district was 950 Kg/ha, state with 950 Kg/ha and potential yield was 950 Kg/ha. The variety which was demonstrated was VBN 6. The maximum yield was 9.74 qtl/ha and average yield was 9.48 qtl/ha. The yield gap minimized was 0.2% (Table 2).

Table 1. Critical inputs provided to cluster FLD farmers

Sl.No.	Critical inputs	Name	Quantity	Value (Rs.)	No. of farmers	No. of clusters/villages
1	Seeds	VBN 6	60 Kgs	7200	30	1
2	Fertilizers (Organic and inorganic)	Vermicompost	500 Kgs	5000	30	1
3	Micro-nutrients	Pulse wonder	20 Kgs	4000	30	1
4	Weedicides, Pesticides, Fungicides etc.	Pendimethaline	9 lit	3960	30	1
5	Bio-agents	Pheramone Trap, Pheramone lure	40 Nos 40 Nos	2000 1200	30	1
6	Bio-products/nutrient complex/nutrient special	-	-	-	-	-

Table 2. Technical parameters

Crop	Existing (Farmer's) variety name	Existing yield (q/ha)	Yield gap (Kg/ha) w.r.to			Name of Variety + Technology demonstrated	Number of farmers	Area in ha	Yield obtained (q/ha)			Yield gap minimized (%)		
			District yield (D)	State yield (S)	Potential yield (P)				Max.	Min.	Av.	D	S	P
Black gram	Vamban 5	8.25	950	950	950	Vamban 6	30	6	9.74	8.90	9.48	0.21	0.21	0.21

Table 3. Economic Parameters

Variety demonstrated	Farmer's Existing plot (Check)				Demonstration plot				Farmers, feedback
	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	
Vamban 6	32000	99000	67000	3.09	28000	113760	85760	4.06	Vamban 6 was resistant to YMV and gave very good yield

Table 4. Summary on yield and net return parameters

District	Crop name	Existing/ farmers variety	Demo variety	No. of farmers (demos)	Area (ha)	Yield (q/ha)			Yield gap (q/ha)		Net Return (Rs./ha)		
						Demo	Check (existing farmer's variety)	% increase	Demo	check	Demo	Check (existing farmer's variety)	% increase
Pudukkottai	Blackgram	Vamban 5	Vamban 6	30	6	9.48	8.25	14.9	2	125	85760	67000	28.0

Table 5. Socio-economic impact parameters

Crop and variety Demonstrated	Total Produce Obtained (kg)	Produce sold (Kg/household)	Selling Rate (Rs/Kg)	Produce used for own sowing (Kg)	Produce distributed to other farmers (Kg)	Purpose for which income gained was utilized	Employment Generated (Mandays/house hold)
Vamban 6	1020	1020	120	-	-	For family	25

Table 6. Farmer's perception of the intervention demonstrated

Technologies demonstrated (with name)	Farmers' Perception parameters					
	Suitability to their farming system	Likings (Preference)	Affordability	Any negative effect	Is Technology acceptable to all in the group/village	Suggestions, for change/improvement, if any
ICM in Black gram	Suitable	Resistant to YMV	Affordable	-	Yes	Nil

This table showed that economic parameters such as Gross cost of the variety demonstrated was Rs. 28000/ha, gross return was Rs. 113760/ha and net return was Rs. 85760/ ha. The B.C ratio was 4.06 which indicated the profit level (Table 3).

The demonstrated variety VBN 6 showed the yield increase with 14.90 per cent, yield gap was achieved and net return had increased upto 28.0 per cent (Table 4).

The total quantity produced and sold was 1020 Kg/household. The selling rate was 120 Rs/Kg. It generated 25 Man days / household (Table 5).

The black gram VBN 6 variety was resistant to Yellow vein Mosaic Virus and it was affordable to the farmers. The technology demonstrated was accepted in the village. Burman et al. [5] reported that "there is a gap in adoption of technology in major pulse crops both in rain fed and irrigated cropping system" (Table 6).

4. CONCLUSION

The present study revealed that VBN 6 variety of blackgram gave higher yield and net returns in recommended practice (CFLD's) than farmer's practice in all blocks of Pudukkottai district. The highest grain yield was attributed to higher potential with improved variety, timely sowing, nutrient management, weed management, insect, pest and disease management in accordance of scientific package and practice. The replacement of local varieties with improved varieties of maize, paddy and wheat due to CFLDs was reported [6]. The yield of soybean was increased with the intervention on varietal replacement (JS-97-52) in the Umaria district [7]. Economic analysis of different parameter's revealed that net return and additional return were recorded highest with recommended practice (CFLD's). The study was concluded that VBN 6 in recommended practice proved beneficial in respect of yield and economics of blackgram.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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