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Impact of Front Line Demonstrations on Integrated Crop Management in Rice Fallow Black Gram in Srikakulam District of Andhra Pradesh

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ABSTRACT

The productivity of pulses in India is lower than most of the major pulse producing countries. As pulses are the major protein source in Indian diet, India has become the largest importer of pulses. The aim of demonstrations in general is to raise production through transfer of technology to the farming community to increase the yields. Thus, front line demonstrations (FLD) were conducted on ICM in rice fallow black gram in various locations in Srikakulam district in North Coastal Zone of Andhra Pradesh during *Rabi* 2017-18 to 2019-20 to evaluate the difference between demonstrated technologies vis-a-vis practices followed by the local farmers in rice fallow black gram. Foliar nutrient sprays and timely use of appropriate pesticides along with other low-cost technologies has greatly increased the yields (600 kg/ha) of rice fallow black gram recording pod yield of 14 pods per plant over the local check plots on an average. These results have influenced the 110 peer farmers of the same as well as farmers of the neighboring villages from the FLD farmers which have resulted in the adoption of this technology in the district.

Key Words: Black gram, Impact, FLD, ICM practices, Rice fallow.

INTRODUCTION

Pulses are generally fabacian group food grains having rich source of proteins and contribute 11per cent of the total intake of proteins in India (Reddy, 2010). Pulses include red gram, chick pea, soya bean, black gram and green gram. In North Coastal Zone of Andhra Pradesh, pulses can be grown in dry as well as in wet land conditions. Rice fallow cultivation constitutes the major portion of pulse production particularly black gram in Srikakulam district in which the nutrient and weed management has become a menace and are difficult to manage. Hence, farmers are reaping lower yields of 3.75-5.00q/ha against 15.0-20.0q/ha of its potential.

Hence, a baseline survey has been executed to surface out the constraints in black gram production and the results indicated that non availability of Yellow Vein Mosaic(YMV) disease resistant varieties, weed menace, terminal moisture stress, pest and disease incidence and non-adoption of foliar nutrients in addition to the area superseded with higher remunerative maize crop in the district year by year. There is a scope to increase the production and productivity of blackgram in the district. Keeping this in view, front line demonstrations(FLDs)were conducted on "integrated crop management in rice fallow blackgram by the District Agricultural Advisory and Technology Transfer Centre of Srikakulam, an extension unit of Acharya N.G Ranga Agricultural University.

MATERIALS AND METHODS

FLDs were conducted to improve the yields in pulses. Diffusion of Knowledge, rate of adoption and spread of technology by the FLD farmer to the fellow farmers of the same as well as to the other

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Table 1. Diffusion of Knowledge and adoption of ICM technology in rice fallow black gram.

Sr. No.	Name of the technology	Main village		Total no. of farmers influenced
		FLD Farmer spreader for		
		Same village	Other villages	
1	Recommended Varieties likeTBG-104,LBG752,IPU2-43	8	6	14
2	Seed treatment	10	6	16
3	Weed management with herbicide	15	8	23
4	Irrigation	8	4	12
5	Foliar Nutrition spray with 19-19-19@5g/l or 13-0-45 (Multi K) @ 10g/l	10	7	17
6	Pest and disease management	17	11	29

villages was calculated to interpret the results. The study was conducted consequently for three years at farmers' fields growing rice fallow black gram during *Rabi* 2017-18 to 2019-20 on ICM use of YVMV tolerant variety LBG752, foliar sprays with 19-19-19 @ 5g/l and Multi K @ 5g/l along with the use of appropriate pesticides and other low-cost technologies as and when required, in five different locations of Srikakulam district. Farmer's practice was used as a local check to compare the results obtained from the technology and the comparative analysis of costs and returns per hectare was calculated. Two treatments were used for this trial.

T_1: Foliar spray of 19-19-19 @ 5g/l andMulti K(13-0-45) @ 5g/l, use of appropriate pesticides and other low-cost technologies as and when required.

T_2: Farmers' method (No foliar nutrient application and indiscriminate use of pesticides)

The yield data of the demonstration and local check plots were collected and per cent increase or decrease in the yields was calculated. The data of spread of ICM technology in rice fallow black gram by the FLD farmer to the fellow farmers of the same village as well as to the other villages was collected and total number of farmers influenced by the technology was analyzed.

RESULTS AND DISCUSSION

From the table 1 it can be gleaned that the technologies pertaining to pest and disease management were spreader to 29 farmers followed by weed management to 23 farmers as it is perceived as very essential to combat the labour scarcity. The technology component of foliar nutrient application was spreaded to 17 farmers as it boost the crop by supplementing moisture as well as essential nutrients. The results (Table2) from the FLDs organized by the DAATTC, Srikakulam indicated that the adoption of ICM practices in black gram and as a result of good vegetative growth and less biotic stress on the crop the number of branches per plant and pods per plant and has increased. On an average 14 pods per plant were found in the demonstration plots against control plots which recorded only 9 pods per plant. Finally, the average yield of 580, 625 and 790 kg/ha yields were recorded in the consequent years which are 12.62 per cent, 13.43 per cent and 16.18 per cent higher than the local check yields for the years 2017-18,2018-19 and2019-20 respectively. The C:B ratio indicated that the front line demonstrations were very effective and resulted good gross returns to the beneficiary farmers. The treatments were imposed

Table 2. Results of FLDs on ICM in rice fallow black gram.

Sr. No. of location		2017-18			2018-19			2019-20		
		Yield (kg/ha)		Per cent Increase/ Decrease in the yield	Yield (kg/ha)		Per cent Increase/ Decrease in the yield	Yield (kg/ha)		Per cent Increase/ Decrease in the yield
		Demon (T1)	Control (T_2)		Demon (T1)	Control (T_2)		Demon (T1)	Control (T_2)	
1		580	520	11.53	600	525	14.2	870	720	20.83
2		610	545	11.92	587.5	475	23.4	950	790	20.25
3		550	480	14.58	700	650	7.6	685	615	11.38
4		560	505	10.89	662.5	575	15.1	705	645	9.30
5		600	525	14.29	575	530	8.4	760	630	19.12
	Av. yield	580.0	515.0	12.62	625	551	13.43	790	680	16.18
	Av. Cost of cultivation	16360	16468		19595	18910		19750	20600	
	CB Ratio	1: 1.95	1:1.72		1:1.85	1:1.69		1: 2.40	1:1.98	

in the farmer's fields timely with less chemicals which reduced the indiscriminate use of a more number of insecticides for the control of pest and diseases. So, the cost of cultivation has reduced to a remarkable extent resulting increased benefit cost ratio and net returns when compared to the farmers practice.

These findings indicate that the farmers received higher yields with reduced cost of cultivation because of the adoption of ICM practices in rice fallow black gram. The yield data showed that the foliar nutrient sprays and timely use of appropriate pesticides along with other low-cost technologies has greatly increased the yields in the FLD farmers' fields due to availability of sufficient nutrients, reduced sucking pest load on the crop by the erection of sticky traps and timely pesticide sprayings for pod borer control.

Hence this was proved to be the most effective technology when compared to the local check plots in which lack of nutrition and untimely spraying of toxic insecticides has affected the yields. The farmers of the same as well as of the neighboring villages were influenced by observing the visual results and adopted the technology spread by the FLD farmers.

CONCLUSION

The ICM practices in rice fallow black gram proved to be an effective method for the improvement of yields and pest reduction when compared to the farmer's practice of improper management practices and untimely spraying of hazardous and costly chemicals for the pest control. Hence, this type of cost-effective practices for yield improvement may be popularized by the extension system to mitigate the gap for reducing the cost of cultivation and improving the yields of pulses in the district. Mainly illiterate farmers go for a greater number of chemical sprayings for pest management which result in increased cost of cultivation, environmental pollution and lower yields; hence a holistic approach may be adopted by the extension agency to increase the adoption of this technology.

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