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Performance of Soybean variety JS 335 in Phek District of Nagaland

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ABSTRACT

KrishiVigyan Kendra, Porba District of Nagaland in collaboration with AICRP Soybean, SASRD, Medziphema conducted front line demonstrations with 20 beneficiaries of Thipuzu village during the *Kharif* season of 2020-21 and 2021-22. Soybean variety JS 335 was selected for demonstration with all improved practices along with a control plot where farmer's practices were carried out. The results showed higher yield in demonstration plots (2215 and 2325 kg/ha) indicating the existence of technology gap and extension gap. The technology index ranged from 11 to 7 per cent showing a minor gap between technology evolved and technology adopted at farmer's field. Lower technology index signifies the feasibility of the technology. The average net return (Rs.62800/-) and B.C. ratio (3.24) were also highest with improved technology as compared to farmers' practice.

Key Words: Gap, Index, Soybean, Technology, Yield.

INTRODUCTION

In Nagaland, soybean is grown as sole crop or mixed with maize, ragi or arhar etc. It is locally called Naga dal and is consumed mainly in the form of fermented soybean called *axone* and considered as traditional food of Zunheboto District. Its distinctive characteristics and adaptability to diverse agro-climatic conditions and soils make soybean attain popularity worldwide. It is grown in almost all districts of the state covering an area of 25040 ha with a production of 31520t. Zunheboto District alone occupies about 7650 ha area with 9770t production (Anonymous, 2017). In spite of its popularity in the states, the farmers give very little priority for its cultivation on large scale as a sole crop because the productivity is less due to the poor adoption of improved production technology which may be due to extension gap. The traditional practice of slash and burn of the jhum lands has led to gradual decrease in the soil base contents leading to reduced soil fertility. The loss of nutrient due to run off and leaching caused by high rainfall in the region also increased the deterioration of soil health and fertility (Sentimenla, 2020). Therefore, to overcome the soil fertility constraints and to increase the productivity, soybean a leguminous cover crop can protect the soil, fix atmospheric nitrogen in the soil, stimulate the microorganisms to loosen compaction of soil, create well aerated and well drained soil structure and add biomass to the soil which will eventually improve the soil fertility (NEPED, 1999).

MATERIALS AND METHODS

The main objective of front line demonstrations was to demonstrate newly released crop production and protection technologies and its management practices in the farmer's field under different agro-climatic regions. Soybean is an important crop for farmers of Phek district of Nagaland, but the profitability remains low. The present study was carried out by the Krishi Vigyan Kendra, Porba

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Table 1. Performance of FLD during 2020-21 and 2021-22.

Year	Crop (variety)	No of FLD	Area (ha)	Yield (kg/ha)			Per cent increase yield over local check	Technology gap (kg/ha)	Extension gap (kg/ ha)	Technology index (%)
				Potential of variety	FLD yield	Farmers Practices				
2020-21	Soybean (JS 335)	20	10	2500	2215	1308	69	285	907	11.4
2021-22	Soybean (JS 335)	20	10	2500	2325	1426	63	175	899	7.0

Phek District of Nagaland in collaboration with AICRP Soybean, SASRD, Medziphema during the *Kharif* season of 2020-21 and 2021-22 in the farmer's fields in Thipuzu village. The frontline demonstrations were carried out in 10 ha area with 20 beneficiaries and individual demonstration area 0.5 ha. Low productivity and high production cost were identified as major issues during group discussion and surveys. Several gaps in the technological adoption emerged as outcome of the meetings. In order to manage these issues, improved and recommended practices were followed as new intervention during frontline demonstration. In case of the recommended practices, JS 335 variety was selected based on its performance and plant protection measures and cultural practices were followed along with farmer's existing practice. Prior to demonstration, the farmers were selected and trained on the technology. Field visit and training were conducted during the demonstration. Visit of other farmers and extension functionaries were also organized at the demonstration plot to show the significance of large scale cultivation of soybean. Yield data, cost of cultivation, net income, and benefit: cost ratio was calculated and analyzed. Studies on technology gap, extension gap and technology index were calculated as suggested by Samui *et al (*2000).

RESULTS AND DISCUSSION

The results on the performance of FLD (Table 1) conducted for two *kharif* seasons during 2020-21 and 2021-22 at Thipuzu village revealed that FLD performed better than farmers' practice. The percent increase in yield of FLD over check was 50 per cent in both the years and the mean also signifying that with the recommended soybean production technology the yield can be increased. Diwedi *et al* (2010) also observed that technology adoption is the key to increased crop productivity.

The mean yield gap of 230 kg/ha indicating the existence of technology gap may be attributed to the difference in soil fertility status, weather condition and soil moisture availability. This can be put right by carrying out more number of front line demonstrations (FLDs) in different areas of the district. Technological yield gap of crops due to variation in the soil fertility and weather conditions is reported by Raj *et al* (2013).

Extension Gap

Extension yield gap was observed to be more than 850 kg/ha in both the years and also the mean which was much higher than the technological yield gap. This huge difference was mainly due to haphazard sowing practiced among the farming community. Our field agricultural extension workers need to train or transfer technology on soybean to the farming community. Apart from giving knowledge on improved high yield varieties, emphasize should be given to educate the farmers on the importance of line sowing on soybean. This will subsequently help in bringing down the huge extension yield gap. The new technologies will eventually lead to the farmers to discontinue of old varieties with new technologies. This high extension gap requires urgent attention from planners, scientists, extension personnel and development departments. Similar findings were reported by Bhargav *et al* (2017) in their study on extension gap.

Table 2: Economics of FLD and Farmers practices

Year	Cost of cultivation (Rs./ha)		Gross return (Rs./ha)		Net Return (Rs/ha)		B:C Ratio	
	Farmers' practice	FLD	Farmers' practice	FLD	Farmers' practice	FLD	Farmers practice	FLD
2020-21	32000	28000	52320	88600	20320	60600	1.63	3.16
2021-22	32000	28000	57040	93000	25040	65000	1.78	3.32
Average	32000	28000	54680	90800	22680	62800	1.71	3.24

Technology Index

Technology index shows the feasibility of the evolved technology at the farmer's field. The feasibility of the technology will be more if the value of technology index is lower. In the present study, technology indices were found 11.4% and 7.0 % in the year 2020-21 and 2021-22 respectively. The results indicated a minor gap between technology evolved and technology adopted at farmer's field. Raj *et al* (2013) also reported similar findings. Application of different inputs *viz*., improved variety good seed and seed treatment with biofertilizers and other management practices lead to significant increase in growth and yield of soybean under rainfed condition.

Economic Return

Cost of cultivation, gross return, net return and benefit cost ratio (Table - 2) was worked out according to the prevailing price at the time of demonstration. The higher cost of cultivation in farmers' practice was mainly due to a greater number of labours employed for sowing. All economic indices viz., gross return, net return and benefit cost ratio of soybean was higher under improved technology as compared to farmer's practices. Kirar *et al* (2018) also reported similar findings in his study on field pea.

CONCLUSION

The results of frontline demonstrations showed that soybean yield could be increased with the incorporation of improved technological practice. The economic viability of the system is reflected in high benefit: cost ratio which can motivate the farmers towards adoption of interventions demonstrated. Therefore, efforts should be made towards conducting such demonstration in order to narrow the wide extension gap and also bring about economic improvement and empowerment of farmers.

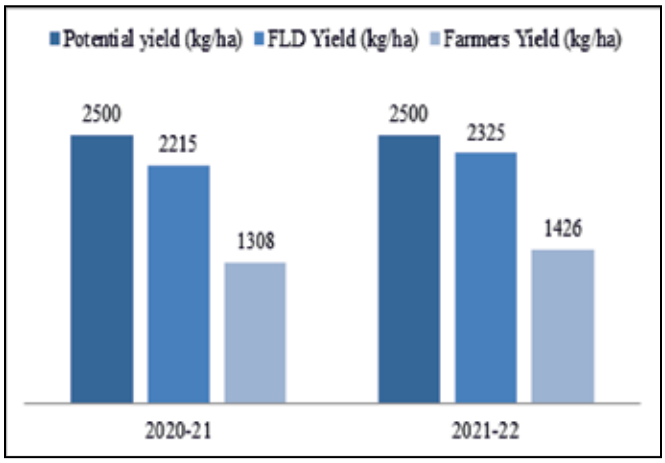

Fig. 1 Soybean yield performance of FLD

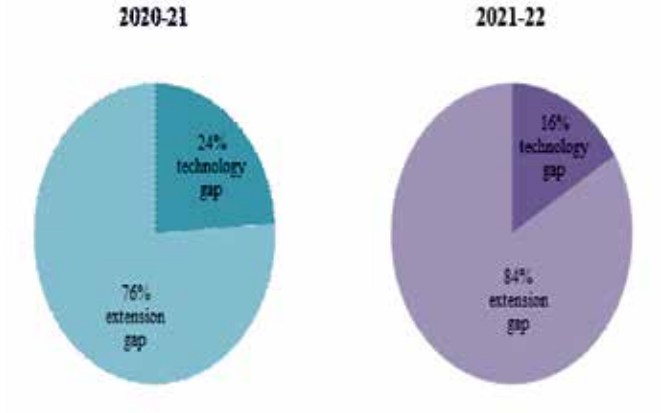

Fig. 2: Technology gap and extension gap of FLD

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