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Impact Analysis of Trainings and Front Line Demonstrations in Black Gram (*Vigna mungo*) Cultivation of Tirap district of Arunachal Pradesh

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A B S T R A C T

The impact assessment for upgraded knowledge levels of farmers regarding scientific package of practices, extent of adoption of selected technology and percent adoption of production technology was carried out in 05 adopted villages. The data showed that Overall farmers knowledge level increased 8 (low level), 52 (medium level) and 28 (high level) per cent, respectively after intervention of Krishi Vigyan Kendra. The maximum knowledge regarding different scientific innovations was found for cultural practices (48%), weed management (41%), integrated nutrient management (35%) pest and disease management (32 %) and pest, IPM (2 %), respectively. The technology index depicted that there was feasibility of evolving technologies at the farmer's field.

Introduction

Black gram (*Vigna mungo*) is a widely grown pulse crop, belongs to the family fabaceae and having good importance for food and nutritional security in the world. Due to short duration crop; by nature and survivalist in all seasons either as sole or as intercrops. India is the world's largest producer as well as consumer of black gram. It produces about 1.5–1.9 MT of black gram annually from about 3.5 m ha of area, with an average productivity of 600 kg/ha. Black gram shares about 10 per cent of India's total pulse production. Therefore, it is necessary to assess the technological gap in production and also to know the problems and constraints in adopting modern black gram production technologies; Islam *et al.,* (2011). Keeping all these in mind, the present investigation was carried out to

find out the current knowledge level of black gram producers with following points: adoption scale of improved practices, yield gap etc.

Materials and Methods

The present study was conducted in Tirap district of Arunachal Pradesh during Kharif season of 2017-18. Twenty five farmers from 5 villages *viz.*, Noitong, Nutan Basti, Lekhi Basti, Makat and Doidam were selected. The data were collected through personnel interview, tabulated and analyzed to find out the findings and draw the conclusion. The statistical tool like percentage was employed to analyze the data.

The constraints as perceived by respondents were scored on the basis of magnitude of the problem as per Meena and Sisodiya (2004). The responses were recorded and converted in to mean per cent score and ranked accordingly as per Warde *et al.*,(1991). The extension gap, technology gap and the technology index were work out with the help of formulas given by Samui *et al.*, (2000) as mentioned below:

Extension gap = Demonstration yield-farmers' yield (control)
Technology gap = Potential yield-demonstration yield

Technology index

$$= \frac{\text{Technology gap}}{\text{Potential Yield}} \times 100$$

Results and Discussion

The result revealed that the overall knowledge about black gram cultivation before intervention by the KVK was 44, 38, 9 per cent (low, level, medium level high level), respectively which was positively changed up to 08, 52 and 28 per cent, after intervention of KVK through different training programmes, kisan gosthis, field visits and front line demonstrations (FLDs) (Table 1). The similar findings reported by earlier researchers: Javat *et al.,* (2011) and Das *et al.,* (2010).

In respect to different aspects of scientific cultivation of black gram; the total 48 % of farmers were possessing high level of knowledge regarding cultural practice followed by weed management (41%), integrated nutrient management (35 %). While the minimum knowledge were possessed about IPM (25 %) and pest, disease control (32 %) (Table 2).

Before intervention of the KVK, the total 48% of farmers had medium level of knowledge; which was drastically changed after intervention of KVK (71 per cent of the farmers had high level of knowledge regarding scientific cultivation of black gram) (Table 3).
In the case of adoption per cent of different technologies; the Cultural practices segment scored highest adoption percentage (64%) followed by pest and disease control (59%), IPM (56%) respectively, while the minimum adoption per cent was recorded with INM (47%) followed by Weed management (53%) (Table 4).

Yield gap analysis of black gram cultivation

Table 5 clearly showing that the maximum yield (7.76 q/ha) was reported in FLD plots and minimum yield (5.4 q/ha) under farmers' plots. The cost benefit ratio was higher in FLD plot (1:3.35) than control (1: 2.48). These findings are clearly showing that due to knowledge and adoption of scientific practices, the yield of black gram could be increased by 37 per cent, 19 per cent and 40 per cent over the yield obtained under farmers' practices. These findings are supported by findings of Dubey *et al.,* (2010).

Table.1 Overall knowledge of scientific package of practices of blackgram.

Category	Before intervention of KVK	After intervention of KVK
Low level of knowledge	44	08
Medium level of knowledge	38	52
High level of knowledge	9	28

Table.2 Knowledge regarding different technologies for black gram cultivation.

Sr.	Technology	Low	Medium	High
1	Cultural Practices	36	16	48
2	Pest and disease control	25	43	32
3	Integrated pest management	34	41	25
4	Weed management	21	38	41
5	Integrated nutrient management	26	39	35

Table.3 Overall adoption of scientific package of practices of blackgram (percentage)

Category	Before intervention of KVK	After intervention of KVK
Low level of knowledge	26	7
Medium level of knowledge	48	22
High level of knowledge	26	71

Table.4 Adoption of Technologies

S.No.	Name of Technology	Adoption %
1	Cultural practices	64
2	Pest & Disease management	59
3	Integreted Pest Management	56
4	Weed management	53
5	Integreted Nutrient Management	47

Table.5 Productivity, Yield gaps and Technology Index of Black gram

Year	Area (ha)	No of Demos.	Yield (q/ha)		Per cent Increase in yield	B:C ratio		Extension gap (q/ha)	Technology gap (q/ha)	Technology Index
			Demos	Control		Demos	Control			
2016	10	24	6.58	4.80	37	3.26	2.67	1.78	3.24	32.99
2017	10	25	7.93	6.39	19	2.96	2.48	1.54	1.89	19.24
2018	10	25	8.77	5.26	40	3.84	2.30	3.51	1.05	10.69
	Average		7.76	5.48	32	3.35	2.48	2.27	2.06	20.97


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The yield of the front line demonstration trials and potential yield of the crop was compared to estimate the yield gaps which were further categorized into technology and extension gaps (Hiremath and Nagaraju, 2009).

The average extension gap was 2.27 q/ha, which indicates the better and intensive education of farmers through different means like FLD, trainings, kisan gosthi, field visits etc. The average technology gap was 2.06 q/ha (ranged between 1.05 q/ha to 3.24 q/ha). The average technology gap from three year of FLDs programme was 25q/ ha. The variation of technology gap observed may be soil fertility status, followed agricultural practices and micro climatic conditions.

Technology index showed that huge gap between farmer's field and demonstration field. There are huge scopes of scientific technologies at the farmer field. Lower the value of technology index, more is the feasibility of technology demonstrated, (Sagar and Chandra, 2004; Arunachalam, 2011 and Kumar *et al.,* 2014).

The reduction of technology index from 32.99 per cent (2016) to 10.69 per cent (2018) exhibited the feasibility of technology demonstrated. Similarly, the yield enhancement in different crops in front line demonstration has amply been documented by Haque (2000), Mishra *et al.,* (2009) and Kumar *et al.,* (2010).

The FLD proved a significant positive results with motivation to researcher for further demonstration of productivity potential and profibility at farmers field. Similar finding were reported by Kirar *et al.,* (2005) and Chauhan and Pandya (2012) in gram.

The scientific knowledge level and adoption level of different technologies on black gram cultivation were positively changed; in five adopted villages after imparting training, FLD, kisan gosthi, field visits, by KVK scientists in Tirap district of Arunachal Pradesh.

The higher productivity recorded under FLD over farmers practices created awareness and also encouraged the other farmers to adopt scientific know how for blackgram cultivation *e.i.,* cultural practices, integrated pest management, integrated nutrient management, integrated weed management etc. in the district.

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