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ROLE OF FRONTLINE DEMONSTRATION ON YIELD OF PULSES

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ABSTRACT

A study was conducted during *kharif* and *rabi* season in seven villages of Sheopur district of Madhya Pradesh, India during 2014-15. A total No. of 24 demonstrations on green gram and chickpea were conducted in area of 10 ha. by the active participation of farmers with the objective to demonstrate the improved technologies of pulses production potential. The improved technologies including use of improved variety, seed treatment, balanced nutrient application and integrated pest management. The average yield of pulses under demonstration [green gram (691kg/ha) and chickpea (1582kg/ha)] were much higher than as compared to average yield of farmer's practices [green gram (533kg/ha) and chickpea (1345kg/ha)]. The average percentage increased in yield over farmer's practices was 29.64 and 17.62 for green gram and chickpea, respectively. In spite of increasing in yield of pulses, technological gap, extension gap and technology index existed. The improved technology gave higher gross return, net return with higher benefit cost ratio as compared to farmer's practices.

Keywords: Pulses, Yield, Technology gap, Extension gap, Technology index

INTRODUCTION

A number of technical information's or innovations for increasing agriculture production and productivity have been generated by our research system. The farmers have adopted some of them still there are many, which have not reached to our farmers. To increase production and productivity of crops, there is an urgent need that developed technologies are made available to the farmers. Front line demonstration is an effective mechanism for transfer of agriculture technology to the farming community. The objective of FLDs on pulses organized by KVKs is to demonstrate the superior productivity potential of various location specific technologies to practicing farmers and test their viability and provide feedback for necessary changes to improve their acceptability and suitability in real farm situations vis-a-vis prevailing traditional practices.

Pulses are good and chief source of protein for a majority of the population in India. Protein malnutrition is prevalent among men, women and children in India. Pulses contribute 11% of the total intake of protein in India (Reddy, 2010). In India, most of the population being a vegetarian, frequency of pulses consumption is much higher than any other source of protein, which indicates the importance of pulses in their daily diet.

India is producing 14.76 million tons of pulses from an area of 23.63 million hectare, which is one of the largest pulses producing countries in the world. About 90% of the global pigeon pea, 65% of chickpea and 37% of lentil area falls in India, corresponding to 93%, 68% and 32% of the global production, respectively (FAOSTAT, 2010). However, in India about 2.3 million tons of pulses are imported annually to meet the domestic consumption requirement.

Even though pulses production increased significantly during the last decades but continuing the faster growth is a bigger challenge for researchers, extension workers and policy makers to fulfill the domestic consumption requirement of its in India. The productivity of pulses in India is lower than most of the major pulses growing countries. Pulses are grown across the country with the highest share coming from Madhya Pradesh (24%). Though the productivity of pulses in Madhya Pradesh is quite low (764kg/ha) as compared to their potential. Keeping above consideration in view, the present study was carried out in this area for popularizing improved technology of pulses production with objective of increasing pulses production to provide nutritive diet and increasing availability of pulses per capita.

MATERIALS AND METHODS

The field study was conducted by Krishi Vigyan Kendra Sheopur, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya in *kharif* and *rabi* season in the farmers fields of different villages of Sheopur district during 2014-15. Initially Participatory Rural Appraisal (PRA) was done to identify causes of low yield of pulses. It was found that improper production technologies i.e. lake of improved varieties, imbalance use of fertilizers, lake of plant protection measures etc., which pose as serious constraint. Therefore, based on PRA seven villages were selected for frontline demonstrations of pulses. A total no. of 24 frontline demonstration in 10 ha. area were conducted in different villages. Materials for the present study with respect to frontline demonstration was as give below:

1. Improved variety (Green gram HUM-1, Chickpea JG-130)

2. Seed treatment with fungicide

3. Fertilizers (N:P:K) 20:40:20 kg/ha

4. Adoption of IPM

The improved technology included improved varieties, seed treatment, balanced fertilizer application, maintenance of optimum plant population and adoption of IPM etc. The sowing of green gram was done during July and gram during November at 45x10 cm spacing. The seed rate of green gram and chickpea were 15 kg/ha. and 75kg/ha respectively. The both crops were fertilized with recommended doses of fertilizer viz 20, 40, 20 kg N, P_2O_5 and K_2O/ha. Whole quantity of N, P and K were applied as Basel. Hand weeding within lines was done at 25-30 and 50-55 DAS. The crops were harvested at perfect maturity stage.

All the farmers selected for frontline demonstration were small farmers. The soils of area under study were medium with medium to low fertility status. The average rainfall of the area was 822mm. In demonstration plots, critical inputs in the form of quality seed and agro chemicals were provided by Krishi Vigyan Kendra. For the study, technology gap, extension gap and technology index were calculated as suggested by Samui, *et al.,* (2000).

Technology gap = Potential yield - Demonstration yield

Extension gap = Demonstration yield - Farmers yield

$$\text{Technology index (\%)} = \frac{\text{Technology gap}}{\text{Potential yield}} \times 100$$

RESULTS AND DISCUSSION

Yield

Difference in yield was observed between improved technology and farmer's practices. The average yield of pulses under improved technology [green gram (691kg/ha) and chickpea (158kg/ha)] were much higher as compared to average yield of farmer's practices [green gram (533kg/ha), and chickpea (1345kg/ha)]. The average percentage increased in the yield over farmer's practices were 29.94 and 17.62 for green gram and chickpea, respectively. The results indicated that the frontline demonstrations have given a good impact over the farmers of Sheopur district as they were motivated by the new agricultural technologies applied in the front line demonstrations (table 1). These findings are in corroboration with the finding of Poonia and Pithia (2011) and Raj *et al*., (2013)

Technology gap

The technology gap in the demonstration yield over potential yield were 109kg/ha for green gram and 118kg/ha for chickpea. The technological gap may be attributed to the dissimilarity in the soil fertility status and weather condition (Mukherjee, 2003)

Extension gap

The highest extension gap of 237 kg/ha was noted in chickpea followed by 158kg/ha in green gram. This emphasizes the need to educate the farmers through various means for the adoptions of improved agricultural production technologies to bridge the wide extension gap exist between improved technology and farmers practices. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of extension gap. The new technologies will eventually lead to the farmers to discontinue the old technology and to adopt new technology (table 1). These findings are in corroboration with the findings of Hiremeth and Nagaraju (2010) and Raj *et al*., (2013)

Technology Index

The technology index 6.94% for chickpea and 13.62% for green gram were recorded (table 1). The technology index shows the feasibility of the evolved technology at the farmer's fields. Lower value of technology index show more feasibility of the technology (Jeengar, *et al*., 2006)

Economics

Owing to higher crops yield improved technology resulted higher gross return, net return and benefit cost ratio over farmer's practices (table 2). The cultivation of chickpea and green gram under improved technologies gave higher net return of Rs. 40618 and 23406/ha as compared to farmer's practices Rs. 33536 and 16690/ha, respectively. The benefit cost ratio of chickpea and green gram under improved technologies were 3.08 and 2.86 as compared to 2.90 and 2.51 under farmer's practices. These findings are in corroboration with the findings of Mokidue *et al*., (2011).

Based on study it may be concluded that enhanced yield of pulses can be achieved through adoption of improved production technologies. Technological and extension gap can be bridged by popularity of package of practices with emphasis of improved variety, use of proper seed rate, balance fertilizer application and proper use of plant protection measures.

Hence, by conducting front line demonstration of proven technology, yield of pulse crops can be increased to great

Table 1. Productivity, Technology gap, Extension gap and technology index of pulses under FLDs

Name of Pulse crops	Area (ha)	No. of Demonstration	Yield kg/ha			% change over local check	Technology gap (kg/ha)	Extension gap (kg/ha)	Technology index (%)
			Potential yield	Improved technology	Farmers practices				
Green gram	5.00	12	800	691	533	29.64	109	158	13.62
Chickpea	5.00	12	1700	1582	1345	17.62	118	237	6.94

Table 2. Economics of pulses under front line demonstration

Name of Pulse crops	Gross return		Cost of cultivation		Net return		B:C Ratio	
	Improved tech.	Farmer practices	Improved tech.	Farmer practices	Improved tech.	Farmer practices	Improved tech.	Farmer practices
Green gram	35932	27716	12526	11026	23406	16690	2.86	2.51
Chickpea	60132	51120	19514	17574	40618	33536	3.08	2.90

extent. This will subsequently increase the income as well as the food and livelihood security of the farmer's community.

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