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Original Research Article

Impact of Front Line Demonstration on the Yield and Economics of Chickpea in Buldhana District of Maharashtra, India

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A B S T R A C T

The study was carried out Krishi Vigyan Kendra, Buldhana in Buldhana district during 2015-16 and 2016-17. Total 82 front line demonstrations were conducted on chickpea in 60 ha by the active participation of the farmers with the objective of improved technologies of chickpea production potentials. The improved technologies consist improved variety (JAKI-9218), balanced fertilizers (soil test based) application and integrated disease and pest management, etc. The demonstrated recorded an average yield ranging from 1873–2083 kg/ha with a mean of 1978 kg/ha. The per cent increase yield in demonstration 26.76% during 2015-16 and 23.14% during 2016-17 respectively, over the local check. The average extension gap, technology gap and technology index were 368- 382 kg/ha during the period under study. The demonstrated field gave higher gross return (Rs. 79695 /ha) and mean net returns (Rs. 55218 /ha) with average benefit: cost ratio (3.10) compared to the local checks. Present results clearly show that the yield and economics of chickpea can be boost up by adoption of recommended technology.

Keywords

Chickpea, Economics, Frontline demonstration and yield

Introduction

Chickpea, one of the major pulses cultivated and consumed in India, is also known as Bengal gram. Chickpea is a major and cheap source of protein compared to animal protein. In India, chickpea accounts for about 45% of total pulses produced in the country. Similar to the case of other pulses, India is the major producing country for chickpea, contributing for over 75% of total production in the world. Among the major state in India, Maharashtra is leading producer of chickpea. In Buldhana district, 142608 ha area under chickpea cultivation in 2016-17 with 111519 MT production and the productivity of 782 kg/ha. It indicates that the productivity of chickpea in Buldhana is comparatively low, primarily due to unavailability of suitable variety(s) as well as lack of improved production technologies, more specifically the method of sowing and nutrient management. The productivity of chickpea could be increased by adopting recommended scientific and sustainable management production practices (Asiwal and Hussain, 2016 and Singh *et al.*, 2017). Front line demonstration is the new concept of field demonstration with main objective to demonstrated newly released variety with improved practices technologies and its management practices

at farmer's field under different agro climatic regions of the country with varying farming situations. Productivity of chickpea per unit area can be increased by adopting feasible, scientific and sustainable management practices by selecting a suitable variety. With this in view, front line demonstrations held at farmer's field, in a systemic manner, to show case the high yielding new varieties, to convince them to about the potential of improved production technologies to enhance yield of chickpea.

Materials and Methods

The frontline demonstrations were conducted by Krishi Vigyan Kendra, Buldhana in Buldhana district during 2015-16 and 2016-17, a total 82 front line demonstrations on chickpea variety JAKI-9218 was conducted at farmer's field in the Buldhana district. The yield and economic performance of frontline demonstrations, the data on output were collected from FLDs as well as local plots and finally the grain yield, cost of cultivation, net returns with the benefit cost ratio was worked out. For the purpose of investigation, Buldhana district, where FLDs were conducted during 2015-16 and 2016-17. For selection of beneficiary farmers, a list of farmers where FLDs on chickpea were conducted during Rabi 2015-16 and 2016-17 was prepared and taking equal representation. The data were collected through personal contacts with the help of well-structured interview schedule. The gathered data were processed, tabulated, classified and analyzed in terms of mean percent score and ranks in the light of objectives of the study. More than 10 percent difference between beneficiary and non-beneficiary farmers' was considered as significant difference. The extension gap, technology gap and technology index were calculated using the formula as suggested by Samui *et al.*, (2000).

Extension gap (qha^{-1}) = Demonstration yield– Farmer's yield

Technology gap (qha^{-1}) = Potential yield – Demonstration yield

Technology index (%) = [Potential yield – Demo yield / Potential yield] x 100

Results and Discussion

A comparison of the productivity level between front line demonstrations and local checks is shown in Table 1. It is evident from results that under the demonstrate plot, performance of chickpea (yield) was sustainable higher than that in the local check in all the years of the study (2015-16 and 2016-17). Yield in chickpea under demonstration ranged from (1873–2083 kg/ha) during the period under study. Technological intervention, thus, enhanced yield to a tune of 26.76% during 2015-16 and 23.14% during 2016-17 respectively, over the local check. Fluctuations in yield observed over the years were mainly on account of variation in soil moisture availability, rainfall, sowing time and pest and disease attack. Similar enhancement in yield in chickpea under front line demonstrations was documented by Dhaka *et al.*, 2015; Lal *et al.*, 2016; Meena *et al.*, 2016 and Verma *et al.*, 2016.; Asiwal and Hussain, 2016 and Singh *et al.*, 2017. Yield in front line demonstration and potential yield of the crop was compared for estimating yield gaps. These gaps were further categorized as technology and extension gaps. Technology gap indicates a gap in demonstration yield over the potential yield, and this was 327 and117, 2015-16 and 2016-17respectively (Table 2). The technology gap observed may be attributed to dissimilarities in soil fertility, salinity and to erratic rainfall and other vagaries of weather in the demonstration areas.

Table.1 Yield and yield difference of Bengal gram under front line demonstrations

Year	No. of FLDs	Yield (Kg/ha)		Additional yield over local check (kg/ha)	Per cent increase yield over Local Check
		FLD	Local check		
2015-16	37	1873	1505	368	26.76 %
2016-17	45	2083	1701	382	23.14 %

Table.2 Yield gap and technology index in front line demonstrations

Year	No. of FLDs	Technology gap (Kg/ha)	Extension Gap (Kg/ha)	Technology Index (%)
2015-16	**37**	327	368	16.40
2016-17	**45**	117	382	5.90
Mean		222	375	11.10

Table.3 Economics of front line demonstrations

Year	Cost of Cultivation (Rs/ha)		Gross return (Rs/ha)		Net return (Rs/ha)		B:C ratio	
	FLD	Local check	FLD	Local check	FLD	Local check	FLD	Local check
2015-16	23994	21661	72559	61788	48566	40127	3.02	2.89
2016-17	24962	22566	86831	74549	61869	51983	3.49	3.30
Mean	24478	22114	79695	68169	55218	46055	3.26	3.10

Hence, to narrow down the gap between the two types of yield in different varieties, location specific recommendation may become necessary. Extension gap ranged from 368 – 382 kg/ha during the period under study (Table 2). A wide extension gap emphasizes the need to educate farmers using various means to facilitate adoption of improved production technologies, to reverse this trend.

Greater use of the latest, improved production technologies applied to high yielding varieties can subsequently bridge this extension gap between demonstration yield and farmer's yield. New technologies, may, eventually lead farmers into discontinuing obsolete varieties. Technology index refer to the feasibility of variety at farmers field. A lower the value of technology index (mean 11.10 %) more is the feasibility (Table 2). This finding corroborates results of Lal *et al.,* 2016; Meena *et al.,* 2016 and Poonia *et al.,* 2017. The economics of growing coriander under front line demonstrations were estimated and results are presented in Table 3. Economic analysis of yield performance revealed that besides higher production, participating farmers in FLDs realized a higher price of than produce compared to that in the local checks during the period under study. This was so because of a better quality of the produce. Front line demonstrations recorded higher mean gross return (Rs. 79695 /ha) and mean net returns (Rs. 55218 /ha) with average benefit: cost ratio (3.10) compared to the local checks in our study. These results are in line with finding of Meena *et al.,* 2016; Verma *et al.,*

2016 and Poonia *et al.*, 2017. On the basis of above finding in present study, it is concluded that front line demonstrations of improved technology reduces technology gap to a considerable extent, thus leading to increased productivity of coriander in Kota district of Rajasthan. This also improved linkages between farmers and scientists, and built confidence for adoption of the improved technology. Productivity enhancement under FLDs over farmer practices of Chickpea cultivation created a greater awareness, and motivated other farmers not growing Chickpea to adopt improved technologies in this Pulses crop i.e. Chickpea.

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