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Impact of Front Line Demonstration on the Yield and Economics of Chickpea (*Cicer arietinum* L.) in Tribal Area of Madhya Pradesh, India

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A B S T R A C T

The study was carried out in rabi seasons in tribal area in Dhar district of Madhya Pradesh during 2010-11 and 2011-12 for JG-16 variety and 2009-10 and 2012-13 for JG-11 variety of chickpea. The improved technologies consisting use of modern variety, seed treatment with *rhizobium* and PSB culture, balanced fertilizer application and integrated pest management. FLD recorded higher yield as compared to farmer's local practice. The average results of two pooled data revealed that the front line demonstration on chickpea an average yield was recorded 14.95 q/ha under demonstrated plots as compare to farmers practice 11.98 q/ha for JG 11 variety and average yield was recorded 13.95 q/ha under demonstrated plots as compare to farmers practice 8.74 q/ha for JG 16 variety. The improved technology gave higher gross return, net return with higher benefit cost ratio as farmer's practices.

Introduction

Historically India is the largest producer, consumer and importer of pulses. Pulses are a 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 proteins in India (Reddy, 2010). In India, frequency of pulses consumption is much higher than any other source of protein, which indicates the importance of pulses in their daily food habits. Keeping the cheapest source of protein, it is important to increase pulses production to increase balanced diet among the socially and economically backward classes. India accounts for 33% of the world area and 22% of the world production of pulses. 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 (FAO STAT, 2012). Although it is the world's largest pulses producer, India is importing 3-4 million tons (MT) of pulses every year to meet its domestic demand. However, during the last decade, growth in pulses production has increased significantly. India achieved a record 18.1 MT pulses production in 2010-11 with in Pigeon pea (3.27 MT), chickpea (8.25

MT), moong (1.82 MT) and urad (1.74 MT). Pulses are grown across the country with the highest share coming from Madhya Pradesh (24%), Uttar Pradesh (16%) and Gujarat (23 %).

Chick pea (*Cicer arietinum* Linn.) is an important *rabi* season food legume having extensive geographical distribution and contributing 39 per cent to the total production of pulse in the country. It is a good source of protein (18-22 %), carbohydrate (52-70 %), fat (4-10 %), minerals (calcium, phosphorus, iron) and vitamins. It is an excellent animal feed. Its straw also had good forage value. The world's total production of chick pea hovers around 8.5 million metric tons annually and is grown over 10.7 million hectares of land approximately. Its average productivity is 789 kg/ha. The major chick pea producing states are Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharastra, Andhra Pradesh, Gujrat, Karnatka, Haryana, Bihar and West Bengal. Abiotic stresses are responsible for declining of yield potential. Through much progress has been made in the field of agriculture research and education, but benefits of these developments could not be realized by the farming community because of low adoption of technologies at the farmers level. Front line demonstration (FLDs) is introduced by the Indian Council of Agricultural Research, New Delhi with inception of technology mission of pulse and oil seed crops during mid-eighties. The field demonstration could under the close supervision of scientist of the KVKs. Looking of above fact its yield productivity is far below the potential yield, so front line demonstration were undertaken by the Krishi Vigyan Kendra, Dhar on the improved package of practices of chick pea in the district. Therefore, this investigation was carried out in this area for popularizing of pulse production with objective of providing nutritive diet and increase availability of pulse per capita.

Materials and Methods

Front line demonstration (FLDs) on chickpea was conducted by Krishi Vigya Kendra, Dhar (M.P.) during 2010-11 and 2011-12 for JG-16 variety and 2009-10 and 2012-13 for JG-11 variety in selected tribal villages of district Dhar of Madhya Pradesh. In general soil of the area under study was medium black with medium fertility status. The component demonstration of front line technology in chickpea was comprised of improved variety JG-11 and JG-16 proper seed rate and sowing method, balance dose of fertilizer (18 kg Nitrogen + 46 kg P2O5 /ha), use of Trichoderma @ of 5g/kg of seed as seed treatment, proper irrigation, weed management and protection measure. In the demonstration, one control plot was also kept where farmers practices was carried out. The FLD was conducted to study the technology gap between the potential yield and demonstrated yield, extension gap between demonstrated yield and yield under existing practice and technology index.

The yield data were collected from both the demonstration and farmers practice by random crop cutting method and analyzed by using simple statistical tools. Site selection and farmers' selection were considered as suggested by choudhary (1999). The observation on seed yield, straw yield per ha were recorded. Other parameters like harvest index, technology index were worked out as suggested by Kadian *et al.,* (1997). The gross return, net return, cost of cultivation and benefit cost ration were also calculated. Training to the farmers of respective villages was imparted before conducting the demonstrations with respect to envisaged technological.

Results and Discussion

Grain Yield, technology gap, Extension gap, Technology index of Chickpea in district Dhar

was presented in Table-1 for two year pooled data for year 2010-11 and 2011-12 for the JG-16 and 2009-10 and 2012-13 for the JG-11 variety. Full gap was observed in case of use of HYVs, sowing method, seed treatment, fertilizer dose and weed management and partial gap was observed in irrigation and plant protection measure, which definitely was the reason of not achieving potential yield. Farmers were not aware about recommended technologies. Farmers in general used local or old-age varieties instead of the recommended high yielding resistant varieties. Unavailability of seed in time and lack of awareness were the main reasons.

Farmers followed broadcast method of sowing against the recommended line sowing and because of this, they applied higher seed rate than the recommended. The results revealed that the front line demonstration on chick pea an average yield was recorded 13.95 q/ha under demonstrated plots as compare to farmers practice 8.74 q/ha for two year pooled data for JG 16 variety. The average results of two pooled data revealed that the front line demonstration on chickpea an average yield was recorded 14.95 q/ha under demonstrated plots as compare to farmers practice 11.98 q/ha for JG 11 variety. This results clearly indicated that the higher average grain yield in demonstration plots over the years compare to local check due to knowledge and adoption of full package of practices i.e. appropriate varieties such as JG-11, JG-16 timely sowing, seed treatment with

Trichoderma @ 5g/kg of seed, use of balanced dose of fertilizer (18 kg N and 46 kg P_2O_5 ha^{-1}), method and time of sowing, timely weed management and need based plant protection. The average yield of chick pea increased from 27 to 59 percent. The yield of chick pea could be increased over the yield obtained under farmers practices (use of non-descriptive local variety, no use of the balanced dose of fertilizer, untimely sowing and no control measure adopted for pest management) of chick pea cultivation. The above findings are in similarity with the findings of Singh (2002) and Poonia and Pithia (2011). The technology gap the differences between potential yield and yield of demonstration plots were 6.05 and 3.05 q/ha for JG-16 and JG-11 variety respectively. The technology gap observed may be attributed to dissimilarity in the soil fertility status, agricultural practices and local climatic situation.

Extensions gap of 5.21 and 2.97 q/ha were observed for JG-16 and JG-11 variety respectively which emphasized the need to educate the farmers through various extensions means i.e. front line demonstration for adoption of improved production and protection technologies, to revert the trend of wide extension gap. More and more use of latest production technologies with high yielding varieties will subsequently change this alarming trend of galloping extension gap. The technology index shows the feasibility of the demonstrated technology at the farmers' field.

The technology index varied from 16.9% and 30.2 % for JG 11 and JG 16 variety respectively (Table 1). This will accelerate the adoption of demonstrated technical intervention to increase the yield performance of chick pea. The FLD produces a significant positive result and provided the researcher an opportunity to demonstrate the productivity potential and profitability of the latest technology (intervention) under real farming situation which they have been advocating for long time. Similar findings were reported by Kirar *et al.,* (2006), Singh *et al.,* (2014). The inputs and outputs prices of commodities prevailed during the study of demonstrations were taken for calculating gross return, cost of cultivation, net return and benefit: cost ratio (Table 2).

Table.1 Grain yield, technology gap, extension gap, technology index of chickpea under FLDs

Year	Crop	Variety	Area (ha)	No of farmers	Grain Yield (q/ha)			% increase over FP	Technology Gap (q/ha)	Extension Gap (q/ha)	Technology Index (%)
					Potential	RP	FP				
Two year Pooled data (2010-11 and 2011-12)	chickpea	JG 16	5.00	13	20.00	13.95	8.74	59.61	6.05	5.21	30.25
Two year Pooled data (2009-10 and 2012-13)	chickpea	JG 11	11.00	27	18.00	14.95	11.98	27.05	3.05	2.97	16.94

Table.2 Economic analysis of the recommended practices of chickpea under FLDs (Two year Pooled data)

Chickpea variety	Yield (q/ha)		% increase over FP	Gross Expenditure (Rs/ha)		Gross Return (Rs/ha)		Net Returns (Rs/ha)		B:C Ratio	
	RP	FP		RP	FP	RP	FP	RP	FP	RP	FP
JG 16	13.93	8.74	59.32	11000	9000	34884	21855	23884	12855	2.17	1.43
JG 11	14.95	11.98	27.05	14091	13120	42623	31606	28531	18486	2.83	2.225

The cultivation of chickpea variety of JG 16 and JG 11 under improved technologies gave higher net return per hectare of Rs. 23884 and 28531 respectively as compared to farmers' practices. The benefit cost ratios of chickpea variety of JG 16 and JG 11 under improved technologies were 2.17 and 2.83 as compared to 1.43 and 2.22 under farmers' practices. This may be due to higher yields obtained under improved technologies compared to local check (farmers practice). This finding is in corroboration with the findings of Mokidue *et al.,* (2011) and Raj et.al (2013).

The study was under taken to ascertain the economics of chickpea production technologies. Front line demonstration (FLDs) play a very important role to disseminate recommended technologies is shows the potential of technology resulting in an increased in yield at farmers level. The results convincingly brought out that the yield of chickpea can be increase with the intervention on recommended package of practices. These practices may be popularized in this area by the extension agency to bridge the higher extension gaps.

References

Choudhary, B N. 1999. Krishi Vigyan Kendra-A guide for KVK managers. Publication, *Division of Agricultural Extension, ICAR*; 73-78

FAO STAT (2012) FAO STAT - Statistical Database

Kadian, K S., Sharma, R. and Sharma, A.K. 1997. Evaluation of front line demonstration trials on oilseeds in Kangra Vally of Himachal Pradesh. *Ann. Agric. Res.18:40*

Kirar, B.S., Narshine, R., Gupta, A.K. and Mukherji, S.C. 2006. Demonstration: An effective tool for increasing the productivity of Urd. *Ind.Res.J. of Ext. Edu*., 6(3):47-48

Mokidue I, Mohanty A.K., and Sanjay, K (2011) Correlating growth, yield and adoption of urd bean technologies. *Indian J. Ex. Edu.* 11(2): 20-24.

Poonia TC and Pithia MS 2011. Impact of front line demonstrations of chickpea in Gujarat. *Legume Res.* 34(4): 304-307.

Raj A. D., V. Yadav and J. H. Rathod 2013.Impact of Front Line Demonstration (FLD) on the yield of pulses. *International Journal of Scientific and Research Publications*, 3 (9):1-4

Reddy AA 2010. Regional Disparities in Food Habits and Nutritional intake in Andhra Pradesh, India, Regional and Sectoral Economic Studies Vol. 10-2.

Singh Dhananjai, A.K. Patel, M.S. Baghel, Alka Singh, A. K. Singh 2014. Technological Intervention for Reducing the Yield Gap of Chick Pea (*Cicer arietinum* L.) in Sidhi District of M.P. *International Journal of Advanced Research in Management and Social Sciences, 3(3):117-122*

Singh, PK. 2002. Impact of participation in planning on adoption of new technology through FLD. MANAGE Extension Research Review, July-Dec.45-48

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