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Effect of Extension Approaches on Productivity of Chickpea (*Cicer Arietinum* L.) at Mandla District of Madhya Pradesh

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Abstract

Front line demonstrations were conducted on farmers field by krishi Vigyan Kendra ,Mandla ,in 2013-14,2014-15 and2015-16. Total 165 FLD,s were conducted on chickpea in 66 ha area by active participation of the farmers with the objective of improved technologies of chickpea production potentials. The improved technologies consisted improved variety, treatment of seed, proper irrigation, weed management, seed rate, sowing method, optimum plant population, plant protection measures, and proper agronomical practices. The demonstrated plots recorded an average yield ranging from 15.68 to17.87 kg/ha with a mean of 16.64 kg/ha. The per cent increase yield in demonstration 104% during 2013-14, 73.59% in 2014-15 and 88.46% during 2015-16 respectively, over the local check. The average extension gap 8.17, technology gap 2.03 and technology index were 1.11 kg/ha during the period of study. The demonstrated field gave higher gross return (Rs.53186 /ha) and mean net returns (Rs. 49,123 /ha) with average benefit: cost ratio (2.39) compared to the local checks (1.63) results clearly show that the yield and economics of chickpea can be boost up by adoption of recommended technologies.

Key word : Chickpea, grain yield, B:C Ratio.

Introduction

Chickpea is an important source of protein in the diets particularly important in vegetarian diets. Also, it is being used increasingly as a substitute for animal protein.. Front line demonstration (FLD) is one of the most powerful tools of extension because farmers, in general, are driven by the perception that “Seeing is believing”^[1,2,3]. The main objective of front line demonstrations is to demonstrate newly released crop production and protection technologies and its management practices in the farmer’s field

Materials and Methods

A total number of 165 front line demonstration of 0.4 ha each with adjacent plot of local practices through Krishi Vigyan Kendra, Mandla were conducted

under different agro-climatic regions and farming situations. During demonstration in the farmer’s field, scientists are required to study the factors contributing higher crop production, field constraints of production and there by generate production data and feedback information. The present study was conducted at farmer’s field with objective to know the response of and Improved transfer of technology on chick pea with respect to farmer’s community.

during Rabi season of 2013-14, 2014-15 and 2015-16 in farmers field of Eight villages viz. Semarkhapa, Kindri, Bakchheradona, Pondimal, Mohgaon

Chak, Malara, Malari, and Mohaniya patpara, an area of 66 ha were conducted in Mandla district of Madhya Pradesh. The Soil of the area under demonstration was irrigated condition, heavy and light soils with medium to high fertility status. The technology includes improved variety (JG-63, JAKI 9218 and JG-11), treatment of seed with Thirm +Bavistin 2:1 @ 2.5 g/kg seed & Trichoderma viridi @10g/kg of seed, inoculation of microbial organism (Rhizobium + Phosphorus solulizing Bacteria (PSB) @ 20 gm/kg seed) , proper irrigation, (one irrigation prior to sowing and at 40-45 days after sowing(DAS) , weed management,(One hand weeding at 25-30 DAS) seed rate (75 kg / ha under demonstration plots) sowing method (line sowing) spacing between Row & Plant was 30 x 10 cm for chick pea under front line demonstration.) optimum plant population, plant protection measures (Integrated pest management (IPM) +Feramone trap@ 10 trap/ha+Bird purchar @50 pegs/ha+ spray of Quinalphos @1.5 lit. with 500 lit. of water) and proper agronomical practices were maintain under demonstrated plots. The treatments

Result and Discussion

The findings of the present research study as well as relevant discussion have been conferred under following points: Table-1. The gap between the existing and recommended technologies of chickpea in Mandla district was full gap observed in case of high yielding varieties, seed treatment, seed inoculation, fertilizer dose and weed management whereas, partial gap was observed in spacing, irrigation and plant protection measures, which was definitely

comprised of recommended package of practices viz. Integrated nutrient management 20:40:20 NPK kg/ha . The Feramone trap and Bird purcher were fixed after 35-40 days after sowing. One spray of Quinalphos 25E.C. was given at the time of incidence of gram pod borer *Helicoverpa armigera* . maintained under demo. . The sowing of crop seed was done during 25th October to first week of November. The fertilizers were given as per soil test based recommendations as basal dose. The crops were harvested at perfect maturity stage by manually. The following parameters such as-Technology gap between the potential yield and demonstrated yield, extension gap between demonstrated yield and farmers yield, technology index and seed yield under existing practices. The data were collected through personal contact with farmers at farmer's field and after that tabulated and analyzed to find out the findings and conclusion. The statistical tool like percentage used in this study for analyzed data. The extension gap, technology gap and the technology index were worked out^[4].

reason to not achieving potential yield. Farmers were not aware about recommended technologies. In general, farmers used local or old varieties instead of the recommended high yielding resistant varieties . the main reason of the technology gap are unavailability of seed and technical inputs like seed treating materials pests management tools etc in due time and lack of awareness of farmers was the main reasons.

Table :1 Gap analysis between demonstration practices and farmer’s practices (N-60)

Technologies	Demonstration .practices	Farmer’s practices	Gap
Land preparation	Two ploughing	Two ploughing	No gap
Variety	JG-63	Local seed	Full gap
Seed rate (kg/ha)	75 kg/ha	120-130 kg/ha	Higher seed rate
Seed treatment	Thirm +Bavistin 2:1 @ 2.5 g/kg seed & Trichoderma viridi @10g/kg of seed	No seed Treatment	Full gap
Sowing method & spacing	Line sowing (30 cm x 10 cm respectively)	Line sowing (20 cm x 10 cm)	Partial gap
Manures & Fertilizers	20 :40:20 NPK kg/ha	No use of fertilizer	Full gap
Weed management	Two hand weeding at 25-30 and 55-60 DAS	One hand weeding at 35-40 DAS	Partial gap
Disease management	Need based plant protection measurement	No plant protection measurement	Full gap
Irrigation management	Two irrigation at pre flowering and at pod filling stage	One irrigation	Partial gap

Extension gap = Demonstrated yield – Yield under existing practice,

Technology gap = Potential yield-Demonstrated yield

Percent increase yield = Demonstration yield-farmers yield/ Farmers yield x 100

Technology index = Technology gap/ Potential yield x 100

During three years of FLD results obtained are presented in table 2. The data revealed that on an average yield was recorded 16.64 q/ha under demonstrated plots as compare to farmers practice 8.80 q/ha. The highest yield 17.87q/ha was obtained in demonstrated plot during 2013-14 and 9.43 q/ha under farmers practice in 2014-15. This results clearly indicated that the higher average grain yield in demonstration plots over the years compare to farmers practice due to knowledge and adoption of full package of

practices suitable varieties such as JG-63, JAKI 92-18,and JG 11 etc, timely sowing, seed treatment, use of balance dose of fertilizer, timely weed management and need based plant protection.

The average yield of chickpea increased 88.68 per cent higher over farmer’s practices as also reported earlier^[5]. The technology gap were 2.13, 1.63 and 2.32 q/ha during 2013-14, 2014-15, and 2015-16, respectively. On an average technology gap under three years FLD programme was 2.02 q/ha.

Table 2 :Productivity, extension gap, technology gap and technology index of chickpea as grown under FLD and existing package of practices

Year	Area (ha)	No. of Demo.	Variety	Average yield q/ha			% increase yield over F.P.	Extension gap (q/ha)	Tech.gap (q/ha)	Tech, Index
				Potential	Demo.	Farmer				
2013-14	16	40	JG-63	20	17.87	8.67	104	9.20	2.13	1.07
2014-15	20	50	JAKI 92-18	18	16.37	9.43	73.59	6.94	1.63	0.91
2015-16	30	75	JG-11	18	15.68	8.32	88.46	8.36	2.32	1.29
Total	66	165			49.92	26.42	266.05	24.5	6.08	3.27
Mean	--	--	--	--	16.64	8.81	88.68	8.17	2.03	1.11

The technology gap observed may be shows to similarity in the soil fertility status, agricultural practices and local climatic situation. Extension gap of 9.20, 6.94, and 8.36 q/ha were observed during 2013-14, 2014-15 and 2015-16 respectively. On an average extension gap was observed 8.17 q/ha, which emphasized

the need to educate the farmers through various extension means. The technology index varied from 1.07 to 1.29 per cent (table 2). On an average technology index was observed 1.11 per cent, which shows the efficacy of good performance of technical interventions^[5]. This will

accelerate the yield performance of chick pea.

Economics

The economic viability of improved technologies over farmer practices were calculated depending on prevailing prices of inputs and outputs costs (table 3). It was found that cost of cultivation of chickpea varied from Rs.15378 to Rs. 15998 /ha with an average of Rs. 15718 /ha of demonstration as against the variation in cost of cultivation from Rs.9783 to Rs. 9788 /ha with an average of Rs.9849 /ha in farmers practice.

Cultivation of chick pea under demonstration gave higher net return ranged from Rs34962 to Rs. 40019/ha with a mean value of Rs. 49123 /ha as compared to farmers practice which recorded Rs.17094 to Rs. 19964/ha with a mean of Rs. 18103 /ha. The higher benefit cost ratio 2.60, 2.37and, 2.19 were found under demonstration compared to1.75, 2.00,and 1.64 under farmers practice in the corresponding seasons. This may be due to higher yields obtained under demonstrations compared to farmers practice^[2].

Table 3: Profitability of chickpea through front line demonstration

Year	Average cost of cultivation (Rs./ha)		Average gross return (Rs./ha)		Average net return (Rs/ha)		B:C Ratio	
	Demonstration	Farmers practice	Demonstration	Farmers practice	Demonstration	Farmers practice	Demonstration	Farmers practice
2013-14	15378	9783	55397	26877	40019	17094	2.60	1.75
2014-15	15778	9976	53203	29940	37425	19964	2.37	2.00
2015-16	15998	9788	50960	27040	34962	17252	2.19	1.76
Total	47154	29547	159560	838560	112406	54310	7.16	4.93
Average	15718	9849	53186	27952	49123	18103	2.39	1.64

Note : Cost of grain yield estimated at MSP i.e Rs 3100,3175 and 3250 /quintal during 2013-14, 2014-15, and 2015-16 respectively.

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