Impact of frontline demonstration of pigeonpea in transfer of improved technology

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ABSTRACT

Pigeonpea is an important pulse crop of Madhya Pradesh. It is also one of the most important pulse crop of Raisen district of Madhya Pradesh. Krishi Vigyan Kendra, Raisen (M.P.) conducted 60 frontline demonstration of pigeonpea crop. The results were compared with full package of practices *viz*., improved variety, seed rate, proper spacing, plant population, balance fertilizers, plant protection etc. and farmers practices included local/old variety, no seed treatment with fungicides, improper spacing and imbalance use of fertilizers.

The FLD in pigeonpea registered 43.67per cent higher yield over farmers practice on an average. The highest yield (17.0 ha^{-1}) was recorded in the year 2008-09 in FLD, which was 37.65per cent more over the farmers practices (12.35q ha^{-1}). Average extension gap was recorded 4.13 q ha^{-1} and average technology index was recorded 31.53per cent. The technology gap ranged between 4.65 q ha^{-1} to 7.85 q ha^{-1}. On an average technology gap under 5 years FLD programme was 6.36 q ha^{-1}. The results indicated that the frontline demonstration has given a good impact over the farming community of Raisen district as they were motivated by the new agricultural technology applied in the FLD plots.

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INTRODUCTION

Pigeonpea is the most important pulse crop in India, which accounts for 90per cent of the world pigeonpea production (Nene and Sheila, 1990). Among important pulse crops in India, pigeonpea ranks second next to chickpea. It is one of the important pulse crops in Madhya Pradesh. The lower yield of pigeonpea in the region are attributed to the non-availability of improved cultivars that are sensitive to the pest and diseases, which change in the climate for a short period, in addition to the crop and land management practices. In India, pigeonpea is attacked by more than 200 species of insect pests, among which the pod borer (*Helicoverpa armigera*) causes enormous losses (Anonymous, 1987). The pigeonpea wilt Fusarium udune is also a serious disease, which causes mortality of seedlings up to 15-25 per cent in normal year.

Among the different agronomic practices, date of sowing, crop geometry (row spacing), seed treatment, plant population and crop management practices play an important role in determining the yield of pigeonpea. The basic objectives of FLD are the speedy spread of new technology of pigeonpea in the Raisen district.

METHODOLOGY

The present study was carried out by the Krishi Vigyan Kendra, Raisen (M.P.) during *Kharif* seasons from 2004-05 to 2008-09 in farmers field of 3 adopted villages *viz*., Baroda, Bankhedi and Hinotiya Mahalpur. The area under each demonstration was 0.40 ha. (1acre). In the demonstration on control plot was also kept where farmer's practice was carried out. The improved package of practices *viz*., improved variety (JA-4), seed treatment, spacing recommended dose of fertilizers and plant protection management were demonstrated on the farmers field through frontline demonstration in different locations. Materials for the present study with respect of FLD and farmers practices are

Table 1 : Details of pigeonpea growing under FLD and existing practices

Sr. No.	Operation	Existing practices	Improved practices demonstrated
1.	Use of seed	Local seed	Improved variety JA-4+seed treatment with 2g
2.	Spacing	9" (22.5 cm)	Thiram+1g Carbendazim+ seed inoculation
3.	Seed treatment	No use of seed treatment	with Rhizobium 5 g +PSB culture 5g per kg
4.	Fertilizer applied	50 Kg DAP ha^{-1}	of seed +spacing 30 cm(12")+Fertilizer 100 kg
5.	Control of gram pod borer	One dusting of dust	DAP ha^{-1} + spray of insecticide

given in Table 1. The demonstration farmers were facilitated by KVK Scientists in performing field operation likes sowing, spraying, weeding, harvesting etc. during the course of training and visit. Data were collected with the help of personal contact. The collected data were calculated and analyzed to draw the inferences. The technology demonstrated are mentioned in Table 1 and compared with local practices.

OBSERVATION AND ANALYSIS

Results of 60 frontline demonstrations conducted during 2004-05 to 2008-09 in 25 ha area of farmers field of 3 villages of Raisen district (Table 2) included the cultivation practices under FLD *viz.,* use of improved variety (JA-4), row spacing 30 cm, seed treatment with Thiram 2g+Carbendazim 1g per kg of seed, balance application of fertilizer (20kg N: 60 kg P ha^{-1}), control of gram pod borer through insecticide at economic threshold levels. The yield of pigeonpea ranged between 12.15 q ha^{-1} and 17.0 q ha^{-1} over observation period, which was 37.65 per cent to 47.35 per cent higher over farmers practices (local check). On an overall basis, 43.67 per cent increase in yield was recorded. However, the variation in yield from location to location accounted for varying climatic condition and variation in agricultural practices followed. More or less similar reasons were provided by Tomar *et al.* (2003).

The highest extension gap ranged from 3.85 q ha^{-1} to 4.65 q ha^{-1} during the period of study. Average extension gap was observed 4.13 q ha^{-1}, which emphasized the need to educate the farmers through various extension means like FLD, for adoption of improved agricultural technologies, to revert the trend of wide extension gap.

The technology gap, the difference between potential yield and yield of demonstration plots, were between 4.65 q ha^{-1} to 7.85 q ha^{-1} on an average technology gap under 5 year FLD programme was 6.36 q ha^{-1}. The technology gap observed may be attributed to dissimilarity in the soil fertility status, agricultural practices and local climatic situation.

The technology index showed the feasibility of evolved technology at the farmer's field. The lower value of technology index more was the feasibility of the technology demonstrated (Sagar and Chandra, 2004). As such, reduction of technology index from 39.25per cent (2004-05) to 23.25per cent (2008-09) exhibited the feasibility of technology demonstrated.

Table 2 : Exploitable productivity, extension gap, technology gap and technology index of pigeonpea as grown under FLDs and existing package of practices

Year	Area	No. of FLDs	Yield q ha^{-1}		% increase over existing	Extension gap q ha^{-1}	Technology gap q ha^{-1}	Technology index %
			FLD	Existing practices				
2004-05	5ha	12	12.15	8.35	45.5	3.85*	7.85**	39.25***
2005-06	5ha	12	13.75	9.50	44.73	4.25	6.25	31.25
2006-07	5ha	12	13.21	9.44	47.35	3.77	6.78	33.90
2007-08	5ha	12	14.00	9.78	43.14	4.22	6.00	30.00
2008-09	5ha	12	17.00	12.35	37.65	4.65	4.65	23.25
Mean	25ha	60	14.02	9.88	43.67	4.13	6.36	31.53

***Extensiongap = Demonstrationyield – Farmer's yield**

****Technologygap = Potentialyield – Demonstrationyield**

$$\text{***Tecnologyindex} \left\{ \frac{\text{(Potentialyield – Demonstrationyield)}}{\text{Potentialyield}} \right\} \text{x100}$$

Conclusion:

The productivity gain under FLD over traditional practices of pigeonpea cultivation created greater awareness and motivated the other farmers to adopt appropriate production technology of pigeonpea in Raisen district. The selection of specific technology like improved variety, seed treatment, spacing, balance use of fertilizers and plant protection measures were undertaken in proper way. These technologies were found to be the main reason for increase in the yield and thus, it could be said that FLDs were the most successful tools for transfer of technology.

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