Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(6): 2151-2153
Received: 21-09-2019
Accepted: 25-10-2019

Mahipal Singh Urre
Krishi Vigyan Kendra, Korba, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India

Pradeep Kumar Ganjeer
College of Agriculture and Research Station, Kanker, IGKV, Raipur, Chhattisgarh, India

Homendra Siwana
College of Agriculture and Research Station, Kanker, IGKV, Raipur, Chhattisgarh, India

Corresponding Author:
Pradeep Kumar Ganjeer
College of Agriculture and Research Station, Kanker, IGKV, Raipur, Chhattisgarh, India

Performance of cluster front line demonstration on productivity and profitability of Pigeon pea (*Cajanus cajan*) in Korba district of Chhattisgarh

Mahipal Singh Urre, Pradeep Kumar Ganjeer and Homendra Siwana

Abstract
The present study was carried out the performance of improved cultivars, seed treatment, weeds, disease, insect and pest management of production as well productivity of pigeon pea. Cluster frontline demonstration (CFLD's) were conducted during 2016-17, 2017-18 and 2018-19 with evaluation the performance of Rajeev lochan variety of pigeon pea in Pondi Uproda, Pali and Korba block of district and the feedback information of farmer's. The result revealed that average yield of pigeon pea under front line demonstration were 9.80, 12.40 and 11.52 q/ha as compare to 6.40, 9.20 and 9.20 q/ha recorded in famer's practice, average yield increase of 34.69, 25.80 and 20.13 per cent and additional return of 16170, 12238 and 11311 Rs/ha respectively. It was observed that the benefit cost ratio (B:C ratio) of recommended practice (CFLD's) were 3.41, 3.72 and 3.19 as compared to 2.39, 3.22 and 2.8 in farmer's practice during consecutive year of study blocks. The average extension gap, average technology gap and technology index were found to 2.97, 6.76 and 37.55 q/ha respectively. Therefore, the results clearly indicates that the use of improved varieties and package and practices with scientific intervention under front line demonstration programme contributed to increase the productivity and profitability of pulses in Chhattisgarh state.

Keywords: Cluster frontline demonstration, pigeon pea, B:C ratio

Introduction
Pulse is the most important food crop in India. It is the second most important group after cereals which play a key role in Indian Agriculture. Their ability to use atmospheric nitrogen through biological nitrogen fixation is economically more sound and environment friendly. Pulses are a good source of protein for a majority of the Indian population. India is the major pulse producing country in the world which shares 30-35% and 27-28% of the total area and production of pulse respectively. Even though pulse production increased significantly during last decade growth but maintaining that trend is a challenge for researcher, extension agencies and policy makers to fulfill the domestic demand (Mishra *et al.*, 2018) [2].

Pigeon pea (*Cajanus cajan* (L.) Millspaugh) is a deep rooted and drought-tolerant (Troedson *et al.* 1990) [6] leguminous food crop used in several countries particularly in India as a source of dietary protein. India accounts for about 80% of the total world pigeon pea production. Pigeon pea is an important pulse crop mainly sown in *kharif* and *Rabi* season. It is best suited to areas having low to moderate rainfall. Indian government imports large quantity of pulses to fulfill domestic requirement of pulses. In this regard, to sustain this production and consumption system, the Department of Agriculture, Cooperation and Farmers Welfare had sanctioned the project "Cluster Frontline Demonstrations on *kharif* Pulses 2016-17" to ICAR-ATARI, Jabalpur through National Food Security Mission. This project was implemented by Krishi Vigyan Kendra, Korba of Zone-VII with main objective to boost the production and productivity of pulses through CFLDs with latest and specific technologies.

Materials and Methods
The present study was carried out by the Krishi Vigyan Kendra, Korba, IGKV, Raipur (C.G.) in *Kharif* Season in the farmer fields in different villages of three blocks *viz*. Korba, Pali and Pondi-Uproda of Korba district in Chhattisgarh plain agro-climatic zone of Chhattisgarh during 2016-17, 2017-18, and 2018-19 in *rainfed* condition on light to medium soil with low to medium fertility status under fallow-pigeon pea production system. Cluster frontline demonstrations were conducted and evaluation the performance of Rajeev lochan variety of pigeon pea in Pondi Uproda, Pali and Korba block of district. In this study, 234 farmers were selected from aforesaid blocks during consecutive year under cluster frontline demonstration of Pigeon pea. All the technological interventions were taken as per prescribed package and

practices for improved variety of pigeon pea crop (Table 1). The grain yield, gap analysis, input cost, net return and additional gain parameters were recorded (Table 2 and 3).

Assessment of gap in adoption of recommended technology before laying out the cluster frontline demonstrations (CFLD's) through personal discussion with selected farmers. The awareness programme (Training) was organized for selected farmers and skilled development about detailed technological investment with improved package and practices for successful pigeon pea cultivation.

The extension activities i.e. awareness programme (Training), farmer's seminar and field days were organized at the cluster front line demonstration sites. The basic information were recorded from the farmer's field and analyzed to comparative performance of frontline demonstration and farmer's practice. Different parameters were calculated to find out technology gap (Yadav *et al.*, 2004).

Extension gap = Demonstrated yield-Farmer's practices yield.

Technology gap = Potential yield-Demonstration yield.

Additional return = Demonstration return-Farmers practice return.

$$\text{Technology index} = \frac{\text{Potential yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

Table 1: Detail of package and practices for pigeon pea cultivation

S. No.	Technological intervention	Farmer's practice	Recommended practice (CFLD's)
1.	Variety	Existing/old recommended cultivar	Rajeev lochan
2.	Seed rate (kg/ha)	25	20
3.	Seed treatment	Not practice	*Trichoderma viride* @ 5 gm/kg, Carbendazim 50 WP @ 3 gm/kg seed
4.	Sowing method/spacing	Broadcasting/un uniform	Line sowing
5.	Time of sowing	June-July	June-July
6.	Nutrient management	Imbalance use of fertilizer	Balance fertilization as per soil test values (STV)
7.	Weed management	No weeding/manually	Pre-emergence S Pendimethalin 30 EC @ 1 lit/acre and Post-emergence Imazethapyr @ 250 ml/acre at 15-20 DAS
8.	Insect, pest and disease management	No/injudicious use of and insecticides and fungicides	Chlorpyrifos 50% + Cypermethrin 5% EC @ 2.5ml/l, Imidacloprid 17.8% SL @ 0.5ml/l.

Table 2: Grain yield and gap analysis of cluster frontline demonstration on pigeon pea

S. No.	Block	No. of demonstration	Average Yield (ha)		% increase in Recommended practice (RP)	Extension gap (q/ha)	Technology gap (q/ha)	Technology index
			Recommended practice (RP)	Farmer practice (FP)				
1.	Pondi-Uproda	81	9.80	6.40	34.69	3.40	8.20	45.55
2.	Pali	54	12.40	9.20	25.80	3.20	5.60	31.11
3.	Korba	99	11.52	9.20	20.13	2.32	6.48	36.00

Table 3: Economic analysis of the cluster front line demonstration on pigeon pea

S. No.	Block	Total Return (Rs/ha)		Input cost (Rs/ha)		Net Return (Rs/ha)		B:C Ratio		Additional gain (Rs/ha) FLD's
		RP	FP	RP	FP	RP	FP	RF	FP	
1	Pondi-Uproda	49490	32320	14500	13500	34990	18820	3.41	2.39	16170
2	Pali	55800	41400	14982	12822	40816	28578	3.72	3.22	12238
3	Korba	65376	55210	20495	18640	44881	33570	3.19	2.8	11311

Result and Discussion

The improved package and practices is more important with technological intervention for productivity and profitability of pulses. Detailed package and practices with technological intervention for recommended practice (Table 1). It was also observed that farmers use injudicious and un-recommended insecticides and mostly farmers didn't use fungicides. Similar observations were reported by Singh *et al.*, 2011 [4].

Grain yield

The grain yield of demonstrated field's and farmer's practice is presented in table 2. Data revealed that average grain yield of demonstrated field's was higher from farmer's practice in all blocks of Korba district. The results revealed that average yield of pigeon pea under cluster frontline demonstrations were 9.80, 12.40 and 11.52 qha^{-1} as compare to 6.40, 9.20 and 9.20 qha^{-1} recorded in farmer's practice, average yield increase of 34.69, 25.80 and 20.13 per cent and additional return of 16170, 12238 and 11311 Rsha^{-1}, respectively. The average yield of Rajeev lochan ranged from 9.80-12.40 qha^{-1} as compared to 6.40-9.20 qha^{-1} of existing variety in all blocks indicating suitability of variety and farming system of district. The average yield of cluster frontline demonstrations (CFLD's) field's was highest in Pali block (12.40 qha^{-1}) followed by Korba (11.52 qha^{-1}) and Pondi-Uproda block (9.80 qha^{-1}). The similar results were in accordance with findings of other workers (Singh *et al.*, 2007, Singh *et al.*, 2011) [5, 4]. The better yield in cluster frontline demonstrations (CFLD's) field may be due to awareness and adoption of package and practices accordingly (Table 1). The present findings are also in accordance with the findings of Sharma (2014) [3] who found that the yield levels under farmer's practices were always lower than obtained under frontline demonstration. The results revealed that extension gap ranged from 2.32-3.40 qha^{-1} in blocks of Korba district which indicated that farmer's should be aware for adoption of improved production technology in pigeon pea. There is a vast gap between the farmer's yield and improved variety yield as per recommended practice through cluster frontline demonstrations on farmer's field. Vittal *et al.* (2005) [7] also supported that frontline demonstrations is better than farmer practices. Technology gaps were also recorded of each blocks and these ranged from 5.60-8.20 qha^{-1}. These gaps may be attributed to the variation in soil fertility status. Similarly technology index were ranged 31.11-45.55 per cent and average figure comes out to be 38.33 per cent. The results

revealed that additional return of Rajeev lochan under cluster frontline demonstrations were ranged 11311-16170 Rsha^{-1} of each block. The programme of large scale frontline demonstration could be popularized for other pulses crops also in order to increase farmer's income and attain self-sufficiency in pulses production.

Economics analysis

Economic analysis of cluster frontline demonstration on pigeon pea revealed that the total return from recommended practice (CFLD's) were 49490 Rsha^{-1} as compared to 32320 Rsha^{-1} in farmer's practice of Pondi-Uproda block. The net returns ranged from 34990-44881 Rsha^{-1} in recommended practice in comparison to 18820-33570 Rsha^{-1} in farmer's practice. It was economically observed that additional gain ranged from 11311-16170 Rsha^{-1} in recommended practice proved beneficial in respect of yield and economics of pigeon pea in consecutive blocks of Korba District in Chhattisgarh Plains.

Conclusion

The present study revealed that Rajeev lochan variety of pigeon pea gave higher yield and net return in recommended practice (CFLD's) than farmers practice in all blocks of Korba district. The higher grain yield was attributed to higher potential with improved variety, timely sowing, nutrient management, weed management and insect, pest and disease management in accordance of package and practice. Economic analysis of different parameter's revealed that net returns and additional gain were recorded highest with recommended practice (CFLD's). The study was concluded that Rajeev lochan in recommended practice provide beneficial in respect of yield and economic of pigeon pea.

Acknowledgement

Authors are thankful to ICAR ATARI, Jabalpur for sanctioning the project and Krishi Vigyan Kendra, Korba for providing necessary official support.

References

1. Yadav DB, Kamboj BK, Garg RB. Increasing the productivity and profitability of sunflower through frontline demonstrations in irrigated agro ecosystem of eastern Haryana. Haryana Journal of Agronomy. 2004; 20(1&2):33-35.
2. Mishra K, Panigrahi S, Sarangi D. Evaluation of Cluster Front Line Demonstration in Green Gram Crop. Int. J Curr. Microbiol. App. Sci. 2018; 7(10):3344-3350.
3. Sharma VP. Problems and prospects of oilseeds production in India, Centre for Management in Agriculture (CMA), Indian Institute of Management (IIM), Ahmedabad, November, 2014.
4. Singh G, Dhaliwal NS, Singh J, Sharma K. Effect of frontline demonstrations on enhancing productivity of mustard. Asian J Soil Sci. 2011; 6:230-33.
5. Singh SN, Singh VK, Singh RK, Singh RK. Evaluation of on farm frontline demonstrations on the yield of mustard in central plains zone of Uttar Pradesh. Indian Res J Ext Edu. 2007; 7:79-81.
6. Troedson RJ, Wallis ES, Laxman Singh. Pigeonpea: Adaptation. In The pigeonpea (Nene YL, Susan D Hall and Sheila VK, Eds.). Wallingford, UK: CAB International, 1990, 159-177.
7. Vittal KPR, Kerkhi SA, Chary GR, Sankar GRM, Ramakrishna YS, Srijaya T *et al*. District wise Promising Technologies for Rainfed Linseed based Production System in India. A Compendium by NARS, State Department (s) of Agriculture and Agro-Industries. All India Coordinated Research Project for Dryland Agriculture Central Research Institute for Dryland Agriculture Santosh Nagar, Hyderabad-500 059, 2005.