Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.7643

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **7 (2):** 625-628 (2019)

Research Article

Integrated Crop Management for Pigeonpea (*Cajanus cajan* L.) Productivity Enhancement in Hyderabad-Karnataka Region

Goudappa S. B.[1*], Preeti[2] and Yusufali. A. Nimbargi[3]

[1]Programme Co-ordinator, [2]Subject Matter Specialist (Horticulture) and [3]Subject Matter Specialist (Agronomy)

ICAR-KVK, Raddewadagi. Tq: Jewargi Dist: Kalaburagi State: Karnataka

*Corresponding Author E-mail: hodextnack@gmail.com

Received: 8.03.2019 | Revised: 13.04.2019 | Accepted: 21.04.2019

ABSTRACT

Integrated Crop Management (ICM) on pigeon pea were laid down at 50 farmer's fields to demonstrate production potential and economic benefits of improved production technologies in Jewargi and Chittapur taluk of Kalaburagi district in Karnataka state during Kharif season during 2016-17. The findings of the study revealed that ICM practices recorded a mean yield of 1550 kg/ha. which is 14.81 per cent higher than obtained with farmer's practice (1350 kg/ha). The improved production technologies gave higher benefit cost ratio (2.95) compared to local checks (2.57) being grown by farmers under locality. The productivity of pigeon pea per unit area could be increased by adopting feasible scientific and sustainable management practices with a suitable variety. Considering the above facts, ICM demonstrations were carried out in a systematic and scientific manner on farmer's field to show the worth of improved practices and convincing farming community about potentialities of improved production management technologies of pigeon pea for further adoption by the farming community.

Key words: *Pigeon pea, ICM, Technology, Production.*

INTRODUCTION

Pigeon pea (*Cajanus cajan* L.) is an important rainfed legume crop for millions of smallholder farmers in India and many other countries of the tropical and subtropical region of the world. In India, it is cultivated on about 3.4 M ha. and contributes to about 20 per cent of the total pulse production of the country. However, its average productivity has remained strikingly low at about 500 to 700 kg/ha. In Karnataka, it is grown over an area of 8.24 lakh ha. with a production of 6.18 lakh ha. and productivity of 316 kg per ha.[1]. There are several biophysical, technical and socioeconomic constraints, which limit the productivity of pigeon pea in India. In order to mitigate these limitations, it is essential to assess the production potential of the environment in relation to achievable and current levels of production as well as the availability of the natural resources. Therefore, the study was undertaken to find out the possible reasons and ways to reduce these yield gaps.

Cite this article: Goudappa, S.B., Preeti and Nimbargi, Y.A., Integrated Crop Management for Pigeonpea (*Cajanus cajan* L.) Productivity Enhancement in Hyderabad-Karnataka Region, *Int. J. Pure App. Biosci.* **7(2):** 625-628 (2019). doi: http://dx.doi.org/10.18782/2320-7051.7643

Integrated Crop Management (ICM) practices have been used as a useful extension tool to demonstrate HYV along with production, protection and management practices in the farmer's field under different agro-climatic regions and farming situations. The improved cultivation practices followed in the national demonstrations have already shown high yield potentials. But knowledge behaviour of general farmers towards these practices is not known and hardly any systematic research has done to explore these areas. Therefore, it is very essential to conduct investigation on ICM demonstrations on pigeon pea to assess their effectiveness and efficiency towards enhancement in yield and economics. Hence a research study was planned and conducted with the aim to analyze and assess the impact of ICM practices pigeon pea on yield, economic conditions, technology and extension gap in Chittapur taluk of Kalaburagi district.

The extent of adoption of improved agricultural technologies is a crucial aspect under innovation diffusion process and the most important for enhancing agricultural production at a faster rate. Large number of technologies evolved in the field of agriculture is not being accepted and adopted to its fullest extent by the farmers. The gap between recommendations made by the scientists and actual use by farmers is frequently encountered. Looking into the situation ICAR-KVK, Raddewadagi has conducted ICM through large scale demonstrations.

MATERIALS AND METHODS

The ICM demonstrations were conducted at ICAR-KVK, Raddewadagi in Kalaburagi district of Karnataka state ten farmer's fields during 2016-17 with objective to popularize improved technologies for productivity enhancement of pigeon pea through ICM. To diffuse pigeon pea productivity enhancement technologies on campus and off campus trainings were conducted. Improved practices like use of improved seed (TS-3R), seed treatment with bio-fertilisers *Rhizobium*, PSB and bio-pesticide *(Trichoderma)*, balanced nutrient application (FYM 5 t/ha, 25 kg N, 50 kg P_2O_5, 125 kg K_2O, 15 kg $ZnSO_4$) and integrated pest and disease management (Timely spray of pesticides). The crop was harvested at maturity stage. For the study, technology gap, extension gap and technology index were calculated as suggested by Samui *et al.*[15].

Technology gap= Potential yield – Demonstration yield

Extension gap = Demonstration yield – Farmers yield

Technology index (%) = (Potential yield – Demonstration yield/Potential yield) * 100

RESULTS AND DISCUSSION

The data were subjected to analysis, technology gap, extension gap and technology index were calculated as per the formula and economic analysis was done as per procedure and data were presented in the table 1 and 2.

Yield analysis

The average yield of pigeon pea was 1550 kg/ha. as against 1350 kg/ha in farmers field which is 14.81 per cent higher. The higher grain yield of pigeon pea in demonstration plot was mainly attributed to the adoption of improved technologies like improved variety TS- 3R, seed treatment with *Rhizobium*, PSB and *Trichoderma*, balanced nutrient application including secondary and micronutrients, integrated pest and disease management, nipping. Application of bio-inputs enabled to mobalise nutrients from native soil nutrients and *Trichoderma* helped the crop to resist against diseases. The results confirm the findings by Keshavareddy *et al.*[10], Dhruw *et al.*[8], Girish *et al.*[9], Dayanand *et al.*[6] and Lathwal[11] and Dhaka *et al.*[7].

Technology gap

The technology gap in the demonstration yield over potential yield was 250 kg per ha. The technological gap may be attributed to the dissimilarity in the soil fertility status and weather conditions[2,5,3].

Extension gap

The extension gap of 200 kg per ha was noticed. This emphasized the need to educate the farmers through various means for the

adoption of improved agricultural technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap[12,4,13].

Technology index (%)

The new technologies will eventually lead to the farmers to discontinue the old technology and to adopt new technology. The technology index shows the feasibility of the evolved technology at the farmer's fields and lower value of technology index more is the feasibility of the technology. In this demonstration noticed 13.89 per cent technologies index, this indicates proper adoption of improved technologies. Similar results were also recorded by Shalini *et al.*[16] in tomato, Renbomo Ngullie and Pijush[14] in chilli.

Economic analysis

The inputs and outputs prices of commodities prevailed during the study demonstrations were taken for calculating gross return, cost of cultivation, net return and benefit cost ratio (Table 2). The cultivation of pigeon pea with improved technologies gave higher net return of Rs 49200/ha. as compared to farmer's practices (Rs 39600/ha.), which gave additional returns of Rs 9600 /ha. The benefit cost ratio of pigeon pea in ICM was 2.95. This is attributed to higher yields obtained under improved technologies compared to farmers plot as local check.

Table 1: Grain yield of pigeonpea, technology gap, extension gap and technology index as influenced by improved practices

Year	Grain yield (Kg/ha.)		% increase in yield in ICM over FP	Technology gap (kg/ha.)	Extension gap (kg/ha.)	Technology index (%)
	ICM	FP				
2016-17	1550	1350	14.81	250	200	13.89

Table 2: Economic analysis of pigeon pea demonstration

Year	Net returns (Rs/ha.)		Additional returns (Rs /ha.)	B:C ratio	
	ICM	FP		ICM	FP
2016-17	49200	39600	9600	2.95	2.57

CONCLUSION

The study shows that the ICM demonstration programme was found useful in enhancing the knowledge and adoption level of farmers in various aspects of pigeon pea production technologies. ICM practices created great awareness and motivated the other farmers to adopt appropriate pigeon pea production technologies. The area of high yielding seedling material of pigeon pea has increased which will spread in the taluk including the adjoining area. The selection of critical input and participatory approach in planning and conducting the demonstration definitely help in the transfer of technology to the farmers.

REFERENCES

1. Anonymous, *Package of Practices*, UAS, Raichur. Pp - 100 (2016).
2. Singh, A. K., Singh, K. C., Singh, Y. P., Singh, D. K., Impact of Frontline Demonstration on Adoption of Improved Practices of Oilseed Crops. *Indian Res. J. Ext. Edu*. **14(3):** 75-77 (2014).
3. Balai, C. M., Meena, R. P., Meena, B. L. and Bairwa R. K., Impact of Front Line Demonstration on Rapeseed-Mustard Yield Improvement. *Indian Res.J.Ext.Edu,* **12(2):** 115 (2012).
4. Bathri, Chouhan, R., Choudhary, S. and Swarnakar, V. K., Impact of Front Line Demonstration on Scientific Temperament of Maize Growers in Jhabua District (M.P.), *Journal of Agriculture and Veterinary Science*, **7(10):** 1-4 (2014).
5. Ajrawat, B., Manu Parmar, A. and Jamwal, M., Impact of front line demonstration of oilseed crops in

improved technology transfer. *Journal of Oilseed Brassica*, **4(2):** 96-97 (2013).

6. Dayanand, R., Verma, K., Mehta, S. M., Boosting Mustard Production through Front Line Demonstrations. *Indian Res. J. Ext. Edu.* **12:** 3-12 (2011).
7. Dhaka, B. L., Meena, B. S. and Suwalka, R. L., Popularization of improved maize production technology through frontline demonstrations in south-eastern Rajasthan. *Journal of Agricultural Sciences,* **1(1):** 39-42 (2010).
8. Dhruw, K. S., Sengar, R. S. and Yadaw, K. N., Level of knowledge and adoption about recommended maize production technology. *Agriculture Update*, **7(3&4):** 311-315 (2012).
9. Girish, K. J, Burman, R. R, Dubey, S. K, Gajab, S., Yield Gap Analysis of Major Rice in India. *J. Community Mobilization Sustain. Dev.* **6(2):** 209-216 (2011).
10. Keshavareddy, G., Kamala Bai, S., Nagaraj, K. H. and Ranganath, S. C., Impact of Front Line Demonstration on Yield and Economics of Pigeon Pea, *Cajanus cajan* in the District of Ramanagara, Karnataka, India. *Int. J. Curr. Microbiol. App. Sci.* **7(1):** 472-478 (2018).
11. Lathwal, O. P., Evaluation of front line demonstrations on black gram in irrigated agro ecosystem. *Ann. Agric. Res.* **31(1&2):** 24-27 (2010).
12. Meena, M. L. and Dudi, A., Growth Parameters and Yield of Maize Varieties (*Zea mays* L.) in Tribal Hills Area of Pali District, Rajasthan, India. *Int. J. Curr. Microbiol. App. Sci.* **7(04):** 2319-2328 (2018).
13. Meena, M. L. and Singh, D., Frontline demonstration for boosting the oilseeds production in Rajasthan: A case study in Pali. *J. Oilseeds Res.* **30(1):** 51-54 (2013).
14. Ngullie, R. and Biswas, P. K., Impact of front line demonstration on the yield of chilli (*Capsicum annuum* L.) *Agriculture Update*, **11(3):** 283-287 (2016).
15. Samui, S. K., Maitra, S., Roy, D. K., Mandal, A. K. and Saha, D., Evaluation of front line demonstration on groundnut. *J. Indian Soc. Coastal Agric. Res*., **18(2):** 180-183 (2000).
16. Shalini, M., Devaraja and Gowda, M., Impact of front line demonstrations on yield and economics of Tomato in Chikkaballapur district of Karnataka. *Int. J. app. and Pure Sci. Agric. (IJAPSA),* **2(07):** 4-8 (2016).