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Productivity Enhancement of Cotton Through Integrated Crop Management Practices in North Eastern Dry Zone of Karnataka

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ABSTRACT
Integrated crop management (ICM) demonstrations on cotton were conducted in 5 farmer's field in Jewargi taluka of Kalaburagi district in Karnataka state during Kharif season during 2016-17. The study findings revealed that Integrated Crop Management (ICM) practices recorded a mean yield of 4450 kg/ha which is 36.92 per cent higher than obtained with farmer's practice (3250 kg/ha). The improved production technologies gave higher benefit cost ratio (3.65) compared to local check (2.47) being grown by farmers under locality. The productivity of cotton 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 an improved practices and convincing farming community about potentialities of improved production management technologies of cotton for further adoption by the farming community.
Key words: Cotton, ICM, Technology, Production.

INTRODUCTION

Cotton is one of the most important cash, commercial and fiber crop of the country, occupy an area of about 11.872 million hectares with a production of 30.47 m tones and average productivity of 568 kg/ha [1]. The productivity of the crop is lowest in Vidarbha as well as in the state of Maharashtra (173 kg lint/ha) as compared to National (299 kg lint/ha) and world (585 kg lint/ha) average. In Karnataka, cotton is grown over an area of 6.63 lakh ha, with a production of 18.02 lakh tones and productivity of 510 kg/ha. Looking into the maximum yields obtained at progressive farmer's fields in Central, North & South zones, it is possible to double the average yield with the existing cotton technologies. In this direction UAS has introduced the average yield with the existing cotton technologies. In this direction UAS has introduced ICM demonstration. This is the unique programme since the scientists are directly involved in conducting demonstrations. This also enables scientists to have first hand information. With a view to communicate cotton production technology widely & for realizing the yields of farmers, around 5 cotton ICM demonstrations of new technologies are laid out directly on farmers field during 2016-17 [17]. 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 integrated crop management (ICM) practices through large scale demonstrations.

MATERIAL AND METHODS

The ICM demonstrations were conducted at ICAR-KVK, Raddewadagi in Kalaburagi district in Karnataka state in 5 farmer's fields during *Kharif* 2016-17 with objective to popularize improved technologies for productivity enhancement of cotton through ICM demonstrations. To diffuse cotton productivity enhancement technologies on campus and off campus trainings were conducted. Improved practices like use of improved seed, seed treatment with bio-fertilisers *Azospirillum,* PSB and bio-pesticide *(Trichoderma),* balanced nutrient application (FYM 10 t/ha, 150 kg N, 75 kg P_2O_5 75 kg K_2O, 25 kg $MgSO_4$)

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.* [16].

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 cotton was 4450 kg/ha. as against 3250 kg/ha. farmer's field which is 36.92 per cent higher. The higher yield of cotton in demonstration plot was mainly attributed to the adoption of improved technologies like improved hybrid, seed treatment with *Azospirillum,* PSB and *Trichoderma,* balanced nutrient application including secondary and micronutrients, integrated pest and disease management, proper method of irrigation. 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 in different crops by Keshavareddy *et al.* [10], Meena *et al.* [12], Dhruw *et al.* [8], Girish *et al.* [9], Dayanand *et al.* [6] and Lathwal [11] and Dhaka *et al.* [7].

Extension gap

The extension gap of 1200 kg/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 gall opening extension gap [12, 13, 5].

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 78.00 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 [15] 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 cotton with improved technologies gave higher net return of Rs 145450/ha as compared to farmer's practices (Rs 86730/ha). The benefit cost ratio of cotton in ICM was 3.65. This is attributed to higher yields obtained under improved technologies compared to farmers plot as local check.

Table 1: Cotton yield, technology gap, extension gap and technology index as influenced by ICM practices

Year	Cotton yield (Kg/ha)		% increase in yield in ICM over FP	Extension gap (kg/ha)	Technology index (%)
	ICM	FP			
2016-17	4450	3250	36.90	1200	78.00

Table 2: Economic analysis of cotton demonstration

Net returns (Rs/ha.)		B:C ratio	
ICM	FP	ICM	FP
145450	86730	3.65	2.47

CONCLUSION

The study has shown that the ICM demonstration programme was found useful in enhancing the knowledge and adoption level of farmers in various aspects of cotton production technologies. ICM practices created great awareness and motivated the other farmers to adopt appropriate cotton production technologies. The area of high yielding seedling material of cotton has increased which will spread in the Kalaburagi 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.

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