



Adoption of IPM technologies in cotton ecosystem of Tapi district

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Abstract : IPM is such a technology that reduces the cost of plant protection and increase the yield. It also helps in reducing the pesticide use and thus, prevents/delays development of pesticide resistance, reduces residues in soil, water, food and definite role in the prevention of environment imbalance. The study was conducted in Tapi district of South Gujarat. Majority of the respondents gained medium level of the overall knowledge and adopted cultural, mechanical and biological practices for pest control. Due to the adoption of IPM in cotton, the data regarding comparison of economics between conventional and IPM technology indicates that the 63 per cent reduction in cost of plant protection in IPM as compared with conventional methods of pest control. Increased in yield was 51 per cent. Additional income from trap crops was Rs. 2150 per hectare. The 56 per cent increase in income and 65 per cent augment in net profit with IPM technology in cotton, respectively. This may be due to the proper guidance given by KVK scientists, demonstrations and constant follow up by KVK missionary. The different constraint faced by cotton growers in adoption of biocontrol measures in cotton was also studied. The study has acknowledged the knowledge level of the cotton growers towards IPM technology. This study can be guideline for other extension worker to implement this way of extension technology for their clients on IPM .On this foundation the extension personnel may locate clients for training and also those who can be used as counselors to other farmers. The study is also useful for effective propagation of the IPM technology in other regions for eco friendly and sustainable agricultural development.

Key Words : Cotton, Pesticide resistance, I.P.M.

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INTRODUCTION

Nizar taluka is situated at the border of Gujarat and Maharashtra. It is located 110 km from district place and Krishi Vigyan Kendra headquarters, Vyara. The Nizar block of Tapi district is far away from district place as well as from NAU research station. Therefore, it is the most neglected block and still today no any extension agency is available to cater the need of farmers regarding agricultural technology. The main crops of the taluka are cotton, chilly, tur in *Kharif* and wheat, chickpea, sugarcane and gram in *Rabi*. Cotton is an important cash crop and plays an important role in Indian economy. Cotton is highly susceptible to several pests. About 166 different species of pests and diseases are reported to attack

cotton at various stages of its growth. Amongst these, the cotton bollworm *Helicoverpa armigera*, the white fly *Bemisia tabaci*, Jassids, *Amrasca biguttula biguttula* and the pink bollworm *Pectinophora gossypiella* have been causing economic damage to cotton crop all over the country. With introduction of Bt cotton, the incidence of sucking pests *viz.*, jassids, thrips, whiteflies, mealy bugs, mites etc. has increased tremendously. Increased use of pesticides resulted in several sour effects like development of resistance in insect pests to insecticides, pest resurgence, pesticides residues, health hazards, destruction of natural fauna, ecological disturbances and environmental pollution, besides increased cost of production. The study was conducted to know the knowledge level of cotton growers regarding IPM components, per cent

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adoption of IPM aids, Comparisons of IPM and conventional methods of pest control in cotton and to study the constraints of cotton growers in adoption of IPM technology.

MATERIALS AND METHODS

The study was conducted in 15 villages of Tapi District in the state of Gujarat. From each village 10 farmers were selected randomly for the study. The total sample size was 150. For selection of the respondent the list of cotton growers was collected with the help of field workers, VLWs and resource persons. The selected respondents were personally interviewed with the help of specially designed interview schedule. The data were subjected to exploratory statistical analysis. The frequency, per cent and constraints were employed to interpret the data and drawing conclusion.

RESULTS AND DISCUSSION

The experimental findings are discussed underneath.

Adoption of recommended package of practices of IPM:

Adoption level:

The overall adoption of IPM technology in cotton was studied and quoted in Table 1.

Table 1 : Distribution of the cotton growers as per over all adoption of IPM Aids. N-150

Sr. No.	Category	Frequency	Per cent
1.	Low adoption	39	26.00
2.	Medium adoption	81	54.00
3.	High adoption	30	20.00

It is palpable from Table 1 that majority of the cotton growers about recommended IPM practices of cotton growers (54.00 per cent) had medium level of adoption of IPM components. There were 26.00 per cent and 20.00 per cent of the respondents had low and high level of adoption in general, respectively; same was also confirmed by Narkar *et al.* (2004).

The data presented in Table 2 clearly stated that the highest (53.00 per cent) respondents having medium level overall knowledge regarding IPM technology, followed by 27.00 per cent and 20.00 per cent having high and low level of overall knowledge, respectively. Whereas the head wise knowledge of cultural practices were medium with fifty per cent of the respondents, followed by 27.00 per cent with high and 23.00 per cent having low level, respectively. The same trends were observed in case of knowledge regarding mechanical and biological control measures. Rombade *et al.* (2011) also reported the same results.

The data regarding comparison of economics between conventional and IPM technology indicates that the 63 per cent reduction in cost of plant protection in IPM as compared

Table 2 : Adoption of IPM technology (n=150)

Characteristics	Number	Percentage
Overall knowledge level		
Low	30	20.00
Medium	80	53.00
High	40	27.00
Total	150	100.00
Head wise knowledge level		
Cultural practices		
Low	35	23.00
Medium	75	50.00
High	40	27.00
Total	150	100.00
Mechanical practices		
Low	30	20.00
Medium	90	60.00
High	30	20.00
Total	150	100.00
Biological practices		
Low	36	24.00
Medium	70	47.00
High	44	29.00
Total	150	100.00

with conventional methods of pest control. Increased in yield was 51 per cent. Additional income from trap crops was Rs. 2150 per hectare (Table 3). The 56 per cent increase in income and 65 per cent increase in net profit were observed with IPM technology in cotton, respectively.

Table 3 : Comparison of economics of IPM demonstration plot and control plot in cotton crop

Particulars	IPM demonstration plot	Control plot (Non IPM plot)
Number of spray	6	9
Cost of plant protection (Rs./ha)	4850	7900
Average yield (q/ha)	30.56	20.18
Income from maize crop (Grown as inter crop) (Rs./ha)	2150.00	00
Gross income (Rs./ha)	90102.00	57900.00
Net profit (Rs./ha)	86101.00	52300.00

The data presented in Table 4 revealed that 91.00 per cent respondents opined their lack of knowledge regarding *Metarhizium* Sp. as constraint and 70.00 per cent had lack of knowledge regarding BT. Application. Monetary constraints were expressed by 63.00 per cent respondents. Inability of spraying of chemicals is expressed by 61.00 per cent respondents. 57.00 per cent cotton growers expressed *Crysopa* fly on other's field, followed by 43.00 and 40.00 per cent non-

Table 4 : Distribution of the cotton grower respondents as per their constraints in adoption of biocontrol in cotton (n=150)

Sr. No.	Constraints in adoption	Frequency(150)	Per cent
1.	Lack of knowledge about <i>Metarhizium anisopliae</i>	136	91.00
2.	Lack of knowledge about installing bird percher	40	27.00
3.	Lack of knowledge about <i>Bacillus thuringiensis</i>	105	70.00
4.	No effective result of HaNPV spraying	60	40.00
5.	Monetary problems	95	63.00
6.	No effective result of crysopa	65	43.00
7.	Bio-control measures not available in market eg. tricho cards	85	57.00
8.	No sprays of chemical due to loss of other beneficial insect-pests	92	61.00
9.	Lack of effective extension help	35	23.00
10.	Troubled sprayings due to unseasonal rainfall	45	33.00
11.	Crysopa insect fly on others field	85	57.00
12.	Non considerable result of <i>Bacillus thuringiensis</i>	59	39.00

effectiveness of crysopa and HaNPV. Bokade *et al.* (2009) reported the same results.

Conclusion:

IPM is such a technology which reduces the cost of plant protection and increase the yield. It also helps in reducing the pesticide use and thus, prevents/delays development of pesticide resistance, reduces residues in soil, water, food and definite role in the prevention of environment imbalance. Majority of the respondents gained medium level of the overall knowledge and adopted cultural, mechanical and biological practices for pest control. The data regarding comparison of economics between conventional and IPM technology indicate that the 63 per cent reduction in cost of plant protection in IPM as compared with conventional methods of pest control. Increased in yield was 51 per cent. Additional income from trap crops was Rs. 2150 per hectare. The 56 per cent increase in income and 65 per cent increase in net profit with IPM technology in cotton, respectively. This may be due to the proper guidance given by KVK scientists, Demonstrations and constant follow up by KVK missionary.

Implication:

The study has acknowledged the knowledge level of the cotton growers towards IPM technology. This study can be guideline for other extension worker to implement this way of extension technology for their clients on IPM. On this foundation the extension personnel may locate clients for training and also those who can be used as counselors to other farmers. The study is also useful for effective propagation of the IPM technology in other regions for eco friendly and sustainable agricultural development. The constraints faced by cotton growers in adoption of biocontrol would be useful to extension workers, governments and all related to agriculture and rural development.

This study will be a guideline for other extension workers

to perform better in their field. It leads toward effective, efficient and result oriented work in the field of Agricultural extension. This is a mile stone work for the effective TOT in the tribal dominated interior region of the south Gujarat. It will be eye opening for disseminating any recently released innovative agricultural technology successfully among illiterate and poor participants. At the outset of the concluding we can say KVK Vyara is becoming really an information hub for farming communities. Our efforts are to make this KVK farmers friendly, farmers centric, farmers leading and the overall agricultural development on sustainable basis. Precision farming and eco friendly development of the region is our prime motto. The Research-Extension-Farmer-Market linkage extension approach is a current need of the time to get better agricultural output. The next phase of green revolution can only be possible through integration of all above said approaches.

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