EPRA INTERNATIONAL JOURNAL OF ECONOMIC AND BUSINESS REVIEW
Online Journal ISSN : 2347 - 9671 www . epratrust.com

# IDENTIFY THE ADOPTION LEVEL OF IPM (INTEGRATED PEST MANAGEMENT) ORIENTED COTTON GROWERS IN AN IRRIGATED CONDITION – AN OVERVIEW ANALYSIS

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## ABSTRACT

The present part of the study deals with the adoption of IPM (Integrated Pest Management) oriented cotton cultivators in an irrigated condition. Under irrigated condition, cent per cent of the respondents had adopted the cultural practices *viz.*, growing high yielding and pest resistant hybrids, sowing quality and certified seeds and avoiding cotton ratoon cropping practices.. Regarding mechanical practices more than 60 per cent of the respondents had adopted the mechanical practices *viz.*, collecting and destroying egg, larvae and pupae of pests, removing and destroying pest and disease infected cotton squares, flowers and other shed materials and clipping the terminal portion of main stem traps. With regard to biological practices, the majority of the respondents spraying neem oil. Among chemical practices, three-fourth of the respondents had avoided the repeated use of the same insecticides.

**KEY WORDS:** IPM, Adoption and Irrigated condition

## INTRODUCTION

Cotton is a major cash crop grown in India. Cotton accounts for around 70 per cent of the total fibre consumption in India. Further, export of cotton bales earns a sizable foreign exchange for the country. The use of pesticides had become indispensable for modern strategy of crop production in India particularly under an Intensive Agricultural District Programme. The projected food, fuel wood and fodder requirements in 2025 AD will be 240 m tones, 325 m. cum and 850 m. tones respectively to meet the requirement of about one billion human population and 392 million livestock population. To meet these challenges, it is of utmost importance that in future the insect problems would have to be tackled through Integrated Pest Management ( IPM). IPM has been defined by Pretty et al (1992) as the integrated use of some or all the pest control strategies in a way that not only reduce pest population to economically acceptable levels but it is sustainable and non-polluting. The IPM programme aims at educating the farmers and extension agencies through Farmers Field Schools (FFS). Under FFS programme, farmers are made experts in identifying natural enemies of pests, monitoring regular pests and taking suitable management measures. In the year 1999-2000 under ICDP (Intensive Cotton Development Programme) totally 1500 FFS were organized and 45000 cotton growers were trained throughout India (Ananymous,2001). The adoption level of IPM practices by cotton farmers is very less even though FFS conducted in all the districts of Tamil Nadu state. So present study is very needed to know the adoption level of farmers with regard to IPM practices.

## SPECIFIC OBJECTIVE OF THE STUDY

The specific objective of this study was adopted of Integrated Pest Management (IPM) oriented cotton growers under irrigated agro-ecosystem in Coimbatore district of Tamil Nadu, India.

## REVIEW OF LITERATURE

**Krishnamoorthy (1988)** concluded that full adoption of seed treatment practices among irrigated cotton crop was observed with 37.50 per cent of the farmers, followed by 32.50 per cent with partial adoption and 30 per cent with nil adoption. Camillus (1989) observed that all the respondents had adopted the pesticides spraying to control the pests of cotton. A few big farmers avoid the usage of pyrethroids and none of the respondents adopted the biological practices.

**Devi (2000)** reported that cent per cent of the cotton growers adopted the IPM practices viz., raising pest and disease resistant varieties, using acid delinted seeds at the correct seed rate, destruction of crop residues, and removal of cotton stalks in the field. Ramamoorthy (2000) concluded that from his study that the IPM adopters of rice fallow cotton farmers have applied more organic manure and balanced dose of inorganic manure of NPK. The non-IPM adopters have applied less organic manure and more of inorganic manure in an imbalanced way.

## RESEARCH METHODOLOGY

Coimbatore district stands first in total number of IPM-FFS training programmes conducted for cotton throuout the Tamil Nadu State over the years and hence, it was selected for the study. The highest area under cotton and maximum number of IPM -FFS training programmes

conducted were considered as the criteria to select the Taluk representing irrigation condition. The same criteria were used for selection of Block where Madukarai block under irrigated condition were selected. In Madukarai block, four villages were selected. A sample of 100 farmers was selected for study. This part deals with the specific objective was to study the adoption of IPM oriented cotton growers under irrigated condition. The lists of items to assess the adoption level were finalized based on consultation with Entomologist, Extension Scientists and by referring to the IPM-FFS Guide. The items were categorized into cultural, mechanical, biological and chemical practices. The response category followed was 'adopted', 'partially adopted' and 'not adopted' and a score of 3, 2 and 1 was assigned respectively. Percentage analysis was worked out to study the practice-wise adoption of respondents on IPM practices.

## FINDINGS AND DISCUSSION

### Practice-wise adoption of IPM practices under Irrigated condition

The distribution of cotton growers according to practice-wise adoption under irrigated condition is presented inTable – 1.

### A.Cultural Practices

It is seen from the Table -1 cent per cent of the respondents had adopted the cultural practices *viz.*, growing high yielding and pest resistant hybrids, sowing quality and certified seeds and avoiding cotton ratoon cropping practices. This was followed by 82.00 and 60.00 per cent of the respondents had following summer ploughing and growing intercrops like blackgram and greengram and growing same hybrid throughout the village respectively. None of the respondents had adopted acid delinting of cotton seeds. This might be due to the fact that, State Department of Agriculture and input dealers distributed delinted seeds to them.

### B. Mechanical Practices

Table 1 also reveals that more than 60 per cent of the respondents had adopted the mechanical practices *viz.*, collecting and destroying egg, larvae and pupae of pests (69 %), removing and destroying pest and disease infected cotton squares, flowers and other shed materials (68 %) and clipping the terminal portion of main stem traps (62 %). Only the meager number of respondents (5 %) were fixing 'T' shaped poles. The reason might be due to that the cotton field and adjacent areas, trees were already available which were being used by birds for perching, so there was no need for 'T' shaped poles in the field.

### C .Biological Practices

The Table 1 indicates that with respect to biological practices majority of the respondents (62 %) spraying neem oil. This might be due to the most of the farmers received neem oil during the IPM-FFS training at subsidized rate. This was followed by 27 per cent about tying *Trichogramma* egg cards. None of the respondents had adopted the practices *viz.*, spraying pungam oil, releasing the predatory reduvid bug, releasing the predator *Chrysopa* etc. This might be due to their low awareness knowledge about these practices.

**Table 1. Practice-wise adoption of IPM practices under irrigated condition**

| S.NO | PRACTICES | Adopted | Partially Adopted | Not Adopted |
|---|---|---|---|---|
| A | **CULTURAL** | | | |
| **1** | Growing high yielding and pest resistant hybrids | 100.00 | 0.00 | 0.00 |
| **2** | Sowing quality and certified seeds | 100.00 | 0.00 | 0.00 |
| **3** | Avoiding cotton ratoon cropping practices | 100.00 | 0.00 | 0.00 |
| **4** | Summer ploughing | 82.00 | 13.00 | 5.00 |
| **5** | Growing intercrops like blackgram and greengram | 60.00 | 10.00 | 30.00 |
| **6** | Growing same hybrid throughout the village | 60.00 | 0.00 | 40.00 |
| **7** | Applying FYM/Compost @ 5 tones/ac | 55.00 | 22.00 | 23.00 |
| **8** | Applying neem cake @ 100 kg/ac | 54.00 | 19.00 | 27.00 |
| **9** | Treating seed with *azospirillum* bio-fertilizer @ 2 packets/ac | 52.00 | 8.00 | 40.00 |
| **10** | Growing bund crops like maize, cumbu and castor | 40.00 | 4.00 | 56.00 |
| **11** | Treating seed with fungal bioagent : *Trichoderma* @ 3 gm/kg seed | 30.00 | 8.00 | 62.00 |
| **12** | Following alternate furrow method of irrigation | 25.00 | 5.00 | 70.00 |
| **13** | Sowing cotton seed by ridges and furrow method | 22.00 | 10.00 | 68.00 |
| **14** | Growing trap crops like sunflower and marigold | 13.00 | 6.00 | 81.00 |
| **15** | Treating seed with mixture of *Trichoderma* 12 gm/ac and and *Pseudomonas* 30 g required seed | 5.00 | 3.00 | 92.00 |
| **16** | Seed hardening with pungam leaf extract @ 3 % /ac | 4.00 | 3.00 | 93.00 |
| **17** | Acid delinting of cotton seeds | 0.00 | 0.00 | 100.00 |
| B | **MECHANICAL** | | | |
| **1** | Collecting and destroying egg, larvae and pupae of pests | 69.00 | 8.00 | 23.00 |
| **2** | Removing and destroying pest and disease infected cotton squares, flowers and other shed materials | 68.00 | 8.00 | 24.00 |
| **3** | Clipping the terminal portion of main stem traps | 62.00 | 26.00 | 12.00 |
| **4** | Fixing sex pheromone @ 5 numbers / ac | 33.00 | 24.00 | 43.00 |
| **5** | Fixing yellow sticky traps @ 5 numbers / ac | 22.00 | 18.00 | 60.00 |
| **6** | Fixing light traps @ 5 numbers / ac | 14.00 | 22.00 | 64.00 |
| **7** | Fixing 'T' shaped poles @ 6 numbers / ac | 5.00 | 7.00 | 88.00 |
| **8** | Covering dark blue cloths with 2 sqft size in 10 places / ac | 0.00 | 0.00 | 100.00 |
| C | **BIOLOGICAL** | | | |
| **1** | Spraying neem oil @ 3 % / ac | 62.00 | 16.00 | 22.00 |
| **2** | Tying *Trichogramma* egg cards 4cc (40 pieces) / ac | 27.00 | 21.00 | 52.00 |
| **3** | Spraying 200 ml NPV(Nuclear Polyhedrosis Virus) / ac to control bollworms | 21.00 | 5.00 | 74.00 |
| **4** | Spraying thuricide Bt (*Bacillus thuringensis*) @ 300 gms / ac | 19.00 | 6.00 | 75.00 |
| **5** | Spraying pungam oil @ 3 % / ac | 0.00 | 0.00 | 100.00 |
| **6** | Releasing the predator *Chrysopa* @ 5000 / ac | 0.00 | 0.00 | 100.00 |
| **7** | Releasing the predatory Reduvid bug @ 2000 / ac | 0.00 | 0.00 | 100.00 |
| **8** | Releasing the egg, larval parasitoid : *Chelonus Blackburni* @ 5000 / ac | 0.00 | 0.00 | 100.00 |
| D | **CHEMICAL** | | | |
| **1** | Avoiding repeated use of the same insecticides | 75.00 | 12.00 | 13.00 |
| **2** | Spraying chemicals in evening hours | 33.00 | 16.00 | 51.00 |
| **3** | Applying correct quantity of pesticides | 26.00 | 54.00 | 20.00 |
| **4** | Applying granular insecticides like carbofuran 3 G @ 12 kg / ac | 17.00 | 33.00 | 50.00 |
| **5** | Applying safe insecticides such as endosulfan @ 200 ml / ac and phosalone @ 100 m | 17.00 | 76.00 | 7.00 |
| **6** | Spraying herbicides such as fluchloralin @ 900 ml / ac and pendimethalin @ 1.3 lit / | 14.00 | 35.00 | 51.00 |
| **7** | Spraying neem based insecticide: *Azadirachtin* @ 200 ml / ac | 12.00 | 22.00 | 66.00 |

## C. Chemical Practices

The Table 1 indicates that as for as chemical practices were concerned, three-fourth (75%) of the respondents had avoiding repeated use of the same insecticides. More than half of the respondents had not-adopting the practices like spraying neem based insecticide: *Azadirachtin,* spraying herbicides such as fluchloralin and applying safe insecticides such as endosulfan The reason for half the respondents non adoption about chemical practices might be the very fact that the traditional behavior of the respondents has not changed with respect to use of chemicals for pest control.

## CONCLUSION

From this study, it is concluded that under irrigated condition, cent per cent of the respondents had adopted the cultural practices *viz*., growing high yielding and pest resistant hybrids, sowing quality and certified seeds and avoiding cotton ratoon cropping practices.. Regarding mechanical practices more than 60 per cent of the respondents had adopted the mechanical practices *viz*., collecting and destroying egg, larvae and pupae of pests, removing and destroying pest and disease infected cotton squares, flowers and other shed materials and clipping the terminal portion of main stem traps. With regard to biological practices, majority of the respondents spraying neem oil. Among chemical practices, three-fourth of the respondents had avoiding repeated use of the same insecticides.

## RECOMMENDATIONS

Both Central and state Government conduct more number of IPM-FFS training programmes in all the districts in order to increase the adoption level of cotton growers by the way to reduce the pest menace, finally increase their productive and income.

## AKNOWLEDGEMENT

My sincere thanks are due to the Assistant Directors of Agriculture, Coimbatore and Agricultural Development Officer of Madukarai block, Agricultural officers and Assistant Agricultural Officers of the study area for their good co-operation extended.

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