

Adoption of Integrated Pest Management (IPM) Practices in an Rainfed Condition Among Cotton Cultivator of Coimbatore District of Tamil Nadu

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Abstract

In recent years, cotton crops have been severely damaged by pests and diseases, leading to crop losses. Implementing integrated pest management strategies will resolve these problems. The current research focuses on the implementation of IPM strategies in rainfed environments. In terms of agricultural methods, the majority of people sow certified, high-quality seeds and cultivate pest-resistant, high-yielding types. Collecting and eliminating pest eggs, larvae, and pupae is a mechanical practice. As far as biological methods go, cotton growers use neem oil, thuricide (Bt), and Trichogramma eggcards. In terms of chemical procedures, the majority of them made sure to use safe pesticides and avoided using the same ones again and again.

Key Words: *Integrated Pest Management, Rainfed Condition, Cotton Cultivator.*

Introduction

According to Singh (1998), the average productivity of cotton lint yield in India was 320 kg/ha, while it was 170 kg/ha in rainfed areas. Over time, less land in Tamil Nadu State was farmed for cotton. Approximately 2.33 lakh hectares were covered in 1998–99. A decline to 1.94 lakh hectares was seen in 2001 (Kannaiyan, 2001). Insects and diseases can cause losses of up to 84% in cotton, 83% in rice, 59% in maize, 58% in soyabean, and 52% in wheat, according to estimates (Inasimuthu, 2002). In the future, Integrated Pest Management (IPM) will be crucial for dealing with insect problems. Integrated pest management (IPM) was described by Pretty et al. (1992) as the sustainable and non-polluting application of various pest control measures to bring the pest population down to economically acceptable levels. Farmers Field Schools (FFS) are a means to an end—the education of farmers and extension agents. The FFS programme helped farmers become specialists by recognising pests' natural enemies, keeping tabs on common pests, and using the right management strategies (Anonymous, 2001).

Review of Literature

Based on research by Devi (2000), all cotton growers utilised integrated pest management measures. These activities included cultivating pest and disease resistant cotton

types, utilising acid-treated seeds at the recommended rate, destroying crop leftovers, and harvesting cotton stalks directly from the field.

Based on his research, Ramamoorthy (2000) found that farmers who used integrated pest management (IPM) on their rice fields also used organic manure and a balanced amount of inorganic NPK. In an uneven distribution, farmers who have not implemented integrated pest management have used less organic manure and more inorganic manure.

Specific Objective of the Study

The objective of this study was to adoption of IPM practices by rainfed cotton growers Coimbatore district of Tamil Nadu.

Research Methodology

The study's selection was based on the fact that, out of all the districts in Tamil Nadu State, Coimbatore has the most IPM-FFS training sessions for cotton. For the investigation, the Avinashi block was chosen because of its rainfed state. Four communities were chosen from that block. The study's sample size was 100 farmers. The items on the list were produced in conjunction with entomologists, extension scientists, and by consulting the IPM-FFS guide in order to measure the adoption of suggested IPM technologies. Culture, technology, biology, and chemistry were the four categories into which the objects fell. A score of 2 was allocated to the "adopted" response and a score of 1 was assigned to the "not adopted" response.

Findings and Discussion

Practice-wise Adoption of IPM Practices under Rainfed Condition

A. Cultural Practices

According to Table -1, all of the respondents in the rainfed condition avoided cotton ratoon cropping. The majority of the respondents used high-quality, certified seeds for sowing (98%), grew pest-resistant, high-yielding varieties (91%), ploughed their fields in the summer (91%), intercropped with other crops (71%), grew the same variety all over the village (68%), applied FYM/compost (65%), grew bund crops (52%), and treated their seeds with azospirillum (52%). In response, the farmers said that they learned a lot about cultural norms and how to implement most technologies throughout the IPM-FFS training programme. Using the ridges and furrows approach to sow cotton seeds was not done by many responders. Rainfed farmers favoured planting in raised beds since they thought this technique wasted rainwater.

B. Mechanical Practices

The majority of the respondents under rainfed conditions used mechanical practices, as shown in Table 1. This included collecting and destroying pest eggs, larvae, and pupae (80%), as well as removing and destroying cotton squares, flowers, and other shed materials (71%). The next steps were to set pheromone traps (68%) and yellow sticky traps (55%), and then to cut the top half of the main stem (51%). No farmer ever used dark blue cloths to cover their fields. The respondents stated that the pheromone traps needed mending because the

State Department of Agriculture provided them at a subsidised rate both during and after the training session.

C. Biological Practices

Table 1 shows that sixty percent of respondents sprayed neem oil and nearly two-thirds of respondents tied *Trichogramma* eggcards as biological practices under rainfed conditions. Half of those people then sprayed thuricide: Bt, and a third sprayed NPV. The following procedures were not implemented by any of the participants: the application of pungam oil; the release of the predator *Chrysopa*; and the release of the egg, larval parasitoid: *Chelonus Blackburni*. A significant number of participants used *Trichogramma* eggcards and neem oil sprays in their adoption process. These participants believed that the State Department of Agriculture provided these materials at a subsidised rate both during and after the training period.

D. Chemical Practices

According to Table 1, when asked about chemical practices in rainfed settings, 95% of respondents said they didn't use the same pesticides twice. Next came identifying ETL for cotton pests (51%), followed by applying granular pesticides like carbofuran (51%). During their time in IPM-FFS training, rainfed cotton farmers learned about the dangers of using the same pesticides again and over, and as a result, more people avoided using them. During the training period, the participants were persuaded of the importance of adhering to the Economic Threshold Level (ETL) when spraying chemical pesticides, which is why half of the responders did so.

Conclusion

Cotton is a crucial commodity crop for the agricultural and manufacturing sectors of the economy of the country in question. In 2000, between 25 and 30 percent of the world's cotton exports came from India. According to Jayaraman (2001), India occupies over a quarter of the world's cotton land. The survey found that under rainfed conditions, almost a third of respondents have implemented most IPM practices in their cultural traditions. Regarding mechanical procedures, over 60% of respondents had implemented three out of eight IPM strategies. Among the biological practices, half of the respondents embraced three while none embraced any of the other three. More than 30% of people who took the survey had implemented six out of eight integrated pest management strategies involving chemicals. Under rainfed conditions, it seems that IPM-trained cotton farmers relied more on mechanical and cultural methods than biological and chemical ones.

Table 1.

Practice-wise Adoption of IPM Practices under Rainfed Condition

S.NO	PRACTICES	Adopted	Not Adopted
A	CULTURAL		
1	cotton ratoon cropping practices	100.00	----
2	quality and certified seeds	98.00	2.00

3	high yielding and pest resistant variety	97.00	3.00
4	summer ploughing	91.00	9.00
5	intercrops like blackgram and greengram	71.00	29.00
6	grow same variety throughout the village	68.00	32.00
7	apply FYM/Compost @ 5 tones/ac	65.00	35.00
8	bund cropping such as maize, cumbu and castor	65.00	35.00
9	seed treatment with <i>azospirillum</i> @ 2 pockets/ac	62.00	38.00
10	seed treatment with fungal bioagent : <i>Trichoderma</i> @ 3 gm/kg of seed	52.00	48.00
11	neem cake application @ 100 kg/ac	47.00	53.00
12	grow trap crops such as sunflower and marigold	44.00	56.00
13	ridges and furrow method of sowing	11.00	89.00
14	seed treatment with mixture of <i>Trichoderma</i> and <i>Pseudomonas</i> fungal bioagents	5.00	95.00
15	seed hardening with pungam leaf extract @ 3%/ac	5.00	95,00
16	acid delinting of cotton seeds	---	100.00
B	MECHANICAL		
1	collecting and destroying egg, larvae and pupae of pests	80.00	20.00
2	removing and destroying pest and disease infected cotton squares, flowers and other shed materials	71.00	29.00
3	fixing sex pheromone traps @ 5 numbers/ac	68.00	32.00
4	fixing yellow sticky traps @ 5 numbers/ac	55.00	45.00
5	clipping the terminal portion of main stem	51.00	49.00
6	fixing 'T' shaped poles @ 5 numbers/ac	47.00	53.00
7	fixing light traps @ 5 numbers/ac	37.00	63.00
8	covering dark blue cloths in cotton field with 2 sqft size in 10 places /ac	---	100.00
C	BIOLOGICAL		
1	tying <i>Trichogramma</i> egg cards 4cc (40 pieces) / ac	64.00	36.00
2	spraying neem oil	60.00	40.00
3	spraying thuricide: Bt (<i>Bacillus thuringensis</i>) @ 300 gm / ac	43.00	57.00
4	spraying 200 ml NPV(Nuclear PolyHedrosis Virus) / ac to control bollworms	35.00	65.00
5	releasing the predator <i>Chrysopa</i> @ 5000 / ac	20.00	80,00
6	spraying pungam oil 3 % / ac	---	100,00
7	releasing the predatory Reduvid bug @ 2000 / ac	---	100.00
8	releasing the egg, larval parasitoid : <i>Chelonus Blackburni</i> @ 5000/ac	---	100.00
D	CHEMICAL		
1	avoiding repeated use of the same insecticides	92.00	8.00
2	applying granular insecticides like carbofuran 3 G 12 kg / ac	51.00	49.00

3	identifying ETL (Economic Threshold Level) for cotton pests	51.00	49.00
4	applying correct quantity of pesticides	45.00	55.00
5	spraying chemicals in evening hours	40.00	60.00
6	applying safe insecticides such as endosulfan @ 250 ml / ac and phosalone @ 100 ml / ac	27.00	73.00
7	spraying neem based insecticide: such as <i>Azadirachtin</i> 200 ml / ac	21.00	79.00
8	spraying herbicide such as fluchloralin @ 900 ml/ac and pendimethalin @ 1.3 lit / ac	20.00	80.00

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