

ADOPTION OF ECO-FRIENDLY INTEGRATED PEST MANAGEMENT PRACTICES FOR SUSTAINABLE SUGARCANE CULTIVATION

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Abstract

Integrated pest management is an eco friendly approach which aims at keeping pest population at below economic threshold level by employing cultural, mechanical, biological and chemical control methods. The study was conducted in Cuddalore district of Tamil Nadu. An ex-post facto research design was followed. 120 sugarcane growers were identified as sample size using proportionate random sampling procedure from the selected villages. Data were collected with the help of well-structured and pre-tested interview schedule. The collected data were analyzed using cumulative frequency distribution and percentage analysis. The results revealed that majority (47.30 %) of the sugarcane growers had low level of adoption of IPM practices. The constraints such as non-availability of bio-control agents (100 %), lack of training on IPM practices (92.56%), high cost of labour (90.83%) and pesticides (85.83%), lack of knowledge on bio-control agents (96.67%), cultural (78.33%) and mechanical methods (77.50%), lack of credit facilities (71.67%) and difficulties in identifying pests (54.17%) were reported by majority of the sugarcane growers.

Key words: Eco friendly integrated pest management, sustainable sugarcane cultivation, sugarcane growers, etc.

1. Introduction

Sugarcane is one of the important commercial crops in the tropics and sub-tropics and serves as the main source of sugar in the world. Globally, it is cultivated over an area of 19.37 million ha, with an annual production of 1252.91 million tonnes and productivity of 64.69 tonnes per ha. India is the second largest producer of sugarcane in the world. Indian sugar industry, second largest after the textile industry, has been playing a vital role in the socio-economic transformation of the country. About 50 million farmers and their dependents have been involved in sugarcane cultivation and additional employment is also generated by the allied industries. Sugarcane may be affected by insect, pathogen, weed and nematode pests. For example, eldana can totally destroy the crop. Rust and smurt reduces yields an average by 30 per cent. Control methods are available for these pests, but are often used in isolation mainly depends on chemical control methods. The large scale and indiscriminate use of pesticides leads to environmental and soil pollution resulting in danger to human life. It also leads to pest resistance in insect pests. The aforesaid problems faced now-a-days are balanced by Integrated Pest Management (IPM) strategies. IPM is defined as the integrated use of all the pest control strategies to control pest population in a sustainable manner without polluting the environments. Need for environmentally sustainable agricultural practices is recognized

worldwide in view of the wide spread ecological imbalances caused by highly intensive agricultural systems. In order to address the adverse impacts of chemical pesticides on agro-ecosystems, integrated pest management has evolved further from ETL based approach to agro-ecosystem analysis based integrated pest management. Keeping the above in view, the study was conducted with the objective of to assess the adoption level of integrated pest management practices by the sugarcane growers.

2. Methodology

This study was conducted in Cuddalore district of Tamil Nadu because sugarcane is cultivated under more area in the district. An ex post facto research method was adopted. Two blocks namely Nallur and Kammapuram was selected based on maximum area criteria. 120 sugarcane growers were selected from the selected six villages using proportionate random sampling procedure. Data were collected with the help of well-structured and pre-tested interview schedule. The collected data were analyzed using cumulative frequency distribution method and percentage analysis.

3. Results and discussions

It could be observed from the Table 1 that two-fifth of the sugarcane growers (47.30 per cent) came under low adoption level followed by medium (40.83 per cent) and high (11.6 per cent) level of adoption. This finding derives support from the findings of Vimali (2001) and Vijayalan (2001). However, Maraddi (2006) in IPM of sugarcane crop and Venkata Shiva Reddy in IPM of vegetable crop observed that extent of adoption of respondents were at moderate level in Karnataka.

TABLE 1

Distribution of Respondents According to their Overall Adoption Level

(n=120)

S. No.	Category	Number of respondents	Percent
1.	Low	57	47.30
2.	Medium	49	40.83
3.	High	14	11.67
	Total	120	100.00

Practice-wise adoption level of IPM practices: The results on distribution of respondents based on their practice wise adoption level are presented in Table 2.

Cultural control methods: It could be observed from Table 2 that majority of the respondents adopted summer ploughing (79.16 per cent) followed by bio-fertilizer sett treatment (43.33 per cent), pest and disease resistant varieties (40.83 per cent). The practices namely intercrop

and avoiding planting of infected sett was adopted by 15.00 per cent and 13.33 percent of the sugarcane growers respectively.

Mechanical control methods: Most of the sugarcane growers (60 per cent) had adopted press mud. Low adoption level was observed with the practices such as control of sucking pest (13.33 per cent), stinging of infected leaf and burn (11.66 per cent), de-trashing (10.83 per cent) and light traps (5 per cent).

Biological control methods: Neem based pesticide was adopted by 42.50 per cent of the sugarcane growers and bio-fungicides (35.33 per cent). None of the growers adopted parasites and virus to control pests.

Chemical method: Majority of the sugarcane growers adopted weedicides (75 per cent) to control weeds followed by pesticide to control internode borer (67.50 per cent), fungicide to control rust (52.52 per cent), fungicide to control smut (43.33 per cent) and pesticide used to control shoot borer (40 per cent) respectively.

TABLE 2

Distribution of Respondents Based on their Practice Wise Adoption Level

(n=120)

S.No.	IPM Practices	No. of Respondents	Per cent
I	Cultural methods		
a)	Summer ploughing	95	79.17
b)	Pest and disease resistant varieties	49	40.83
c)	Intercrop	18	15.00
d)	Bio-fertilizer sett treatment	52	43.33
e)	Avoiding planting of infected setts	16	13.33
II	Mechanical methods		
a)	Stripping of infected leaf and burn	14	11.67
b)	Control of sucking pest	16	13.33
c)	De-trashing	13	10.83
d)	Use of light traps	6	15.00
e)	Use of press mud	72	60.00
III	Biological Method		
a)	Prasites	00	00
b)	Bacillus thuringensis virus	00	00
c)	Bio fungicide application	43	35.83
d)	Neem based pesticide application	51	42.50
IV.	Chemical method		
a)	Chemical used to control shoot borer	48	40.00
b)	Chemical used to control internode borer	81	67.50
c)	Chemical used to control rust	63	52.50
d)	Chemical used to control smart	52	43.33
e)	Chemical used to control weed	90	75.00

TABLE 3

Distribution of Respondent Based on the Constraints in the Adoption of IPM Practices

(n =120)

S.No.	Constraints	No. of Respondents	Percent
1.	Non-availability of bio-control agents	120	100
2.	Lack of knowledge on bio-control agents	116	96.67
3.	Lack of training on IPM practices	111	92.56
4.	High cost of labour	109	90.83
5.	High cost of pesticides	103	85.83
6.	Lack of knowledge about cultural practices	94	78.33
7.	Lack of knowledge about mechanical practices	93	77.50
8.	Lack of credit facilities	86	71.67
9.	Difficulty in identifying pests	65	54.17

From the Table 3 it could be inferred that non-availability of bio-control agent was the foremost constraint expressed by all the respondents. The other major constraints were lack of training on IPM practices (92.50 per cent), high cost of labour (90.83 per cent), high cost of pesticides (85.83 per cent), lack of knowledge about cultural practices (78.33 per cent) and mechanical practices (77.66 per cent), lack of credit facilities (71.66 per cent), and difficulty in identifying pests (54.17 per cent).

4. Conclusion

From the study it could be concluded that most of the sugarcane growers were found to have low level of adoption of IPM practices. Hence, it is suggested that the extension workers and the scientists concerned may conduct demonstrations, field days, intensive training programmes and distribution of printed literature like booklets, leaflets and pamphlets to popularize IPM practices among the farmers and also they may be constantly motivated to adopt all the IPM practices in their cultivation. Intensive efforts may be taken by the concerned cane officers from sugar factories to overcome the constraints experienced by the sugarcane growers in adoption of IPM practices. The state department and cane factories should ensure availability of specialty inputs like bio-control agents to all the growers.

5. Reference

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