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Extent of Adoption of Integrated Pest Management Practices by Paddy Growers

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ABSTRACT

The study was conducted in West Godavari District of Andhra Pradesh during the year 2008-09 to know the adoption of Integrated Pest Management (IPM) practices by paddy farmers. Data was collected from a randomly selected 80 paddy farmers of Matsyapuri, Andaluru (Veeravasaram mandal), Adavikolanu (Nidamarru mandal) and Mogallu (Palakoderu mandal) adopted villages of Krishi Vigyan Kendra, Undi by personal interview method using structured interview schedule. Item analysis of practices revealed that more than half of the paddy farmers (57.50%) had medium adoption level of recommended IPM practices. Whereas remaining paddy farmers had almost equal level of low (22.50%) and high (20.00%) adoption.

Key Words: Adoption, Item analysis, IPM, Paddy

Rice (*Oryza sativa* L.), the dietary staple for more than three billion people, is grown worldwide in diverse agro climatic zones. In Andhra Pradesh, West Godavari District is having the distinction of being rice granary, contributing 16, 42, 681 million tones of annual production from 4, 39, 984 ha of area. However, the grain yield is affected by several biotic and abiotic factors, including damage caused by different insect pests and diseases. Thus, pest management remains as an important functional component in rice production. Farmers currently protect the rice crop against the pests by spraying chemical pesticides. Most farmers are risk averse and seem to have a biased rationale towards the use of pesticides; they tend to use pesticides for prevention. Many farmers also associate pesticide use with modernism. However, farmers fail to control the pests many a times with faulty application of chemical sprays. Furthermore, chemical sprays also pollute land and water, are toxic to non target organisms, accumulate in food chains, and can cause human health problems. In this context, Integrated Pest Management (IPM) has emerged out as the best alternative for combating pest and pesticide induced pollution problems in rice. The strengthing and validation of IPM was implemented by Krishi Vigyan Kendra's (KVKs) through training cum demonstrations.

Inspite of all its advantages, IPM technology has not spread over to all farmers. Moreover, adoption of IPM has not come out as a snap decision but has emerged as a mental process over a period of time among rice farmers. It was felt that the findings with respect to the level of adoption regarding the recommended IPM package of practices by the paddy farmers would focus light on this area where the cultivators were found to be lacking and also the reasons for the non adoption of recommended IPM practices could be brought to surface which would enable the rice researchers in planning appropriate strategies to promote rice IPM among the farmers. Keeping this in view, the present study was designed to know the extent of adoption of IPM package of practices by the rice farmers.

MATERIAL AND METHODS

The present study was conducted in West Godavari District of Andhra Pradesh during the year 2008-09. Ex-post facto research design was adopted for the study. Four adopted villages of Krishi Vigyan Kendra, Undi, West Godavari District Viz., Matsyapuri and Andaluru from Veeravasaram mandal, Mogallu from Palakoderu mandal and Adavikolanu from Nidamarru mandal were selected for the study purpose. Twenty paddy farmers from each village were randomly selected for the study. Thus, total sample size was 80 respondents. Data was collected from the sample of farmers by personal interview method using structured presented interview schedule.

Adoption was operationalized for the purpose of investigation as practicing the recommended package of practices by the respondents. Any deviation in adoption of the recommended package of practices was considered as partial adoption and failure to adopt the recommended package of

Table 1. Overall adoption level of paddy farmers in respect of recommended IPM practices of paddy

n = 80

Category	Frequency	Percentage
Low (Up to 30.15)	18	22.50
Medium (30.15 – 44.33)	46	57.50
High (Above 44.33)	16	20.00
Total	80	100.00
Mean	37.24	
SD	7.09	

practices was considered as non-adoption. Twenty IPM package of practices recommended by Acharya N. G. Ranga Agricultural University were included in the study to measure the extent of adoption. All the recommended package of practices included in the schedule were administered to the respondents after pre-testing and the responses were obtained on a three point continuum as fully adopted, partially adopted and not adopted and scores of 3, 2 and 1 were assigned, respectively. Thus the total score for each respondent was obtained by summing up the scores on all items. The maximum and minimum possible scores were 60 and 20, respectively. Respondents were categorized in to 3 categories i.e., low, medium and high based on their adoption score using mean and standard deviation as a measure of check. Frequency and percentages were worked out to know the extent of adoption of each IPM recommended package of practices of paddy.

RESULTS AND DISCUSSION

Data relating to the categorization of respondents based on their adoption score on IPM technologies was presented in Table 1. The findings indicated that more than half (57.50%) of the paddy farmers were categorized in the group of medium adoption of IPM package of practices of paddy where as remaining paddy farmers were almost equally distributed in low (22.50%) and high (20.00%) categories of adoption level. The adoption of any technology in general and recommended paddy IPM package of practices in particular depend on various factors such as awareness about the complexity of the practices, timely availability of inputs, technologies and characteristics of farmers etc. Though farmers knew the importance of IPM practices, lack of awareness and confidence on advanced IPM practices, no proper monitoring of IPM implementation in their own fields, non availability of inputs and location specific IPM than generalized IPM technology might have influenced the majority of rice growers not to adopt recommended IPM package of practices. Nagdev and Venkataramaiah (2008) reported similar results in their study on plant protection status of IPM trained dry paddy farmers of Maharashtra state.

Adoption of individual recommended IPM package of practices by Paddy farmers

Item analysis of adoption of individual recommended IPM package of practices by the paddy farmers was listed in Table 2.

Cultural practices:

Majority of the paddy farmers were adopting cultural practices like formation of alley ways (85.0%) and regular cleaning of farm bunds (61.25%). The plausible reason for this might be that, it is easy to follow, convenient, involves less cost, easy to do spraying operations and prevent disease spread particularly sheath blight and rice blast. As a result majority of the respondents followed these practices.

Most of the farmers were partially adopting practices of application of Carbofuran 3 G granules @ 160 gm / cent of nursery (56.25%), application of nitrogen fertilizers in split doses as per recommendation (61.25%). This might be due to more contact of the farmers with Subject Matter Specialists of KVK and also experience of the rice farmers that these practices would reduce the pest and disease incidence.

Majority of the farmers were not adopting summer ploughing (77.50%), seed treatment (83.75%), and community approach to manage rodents (55.0%) and harvesting the crop to the ground level (78.75%). The reason given by rice farmers was that the lack of knowledge on the importance of these recommended IPM practices, hence a need was felt to organize awareness training programmes on these aspects along with skill demonstration wherever it is needed. Further it was observed that majority of rice farmers were not

Table 2. Item analysis of extent of adoption of recommended IPM package of practices by paddy farmers

IPM Component	Fully adopted		Partially Adopted		Not adopted	
	Fre-quency	Percent-age	Fre-quency	Percent-age	Fre-quency	Per-centage
CULTURAL PRACTICES						
1. Summer ploughing	6	7.5	12	15.0	62	77.5
2. Raising suitable pest and disease resistant varieties	25	31.5	29	36.5	26	32.5
3. Seed treatment with Carbendazim @1gm/lt/kg seed for 24 hrs to prevent diseases during initial growth period	4	5.0	19	11.25	67	83.75
4. Application of Carbofuran 3G @ 1 kg/5 cents nursery five days prior to pulling seedlings for transplanting	19	23.75	45	56.25	16	20.0
5. Completing transplanting by the end of July in Kharif and by the end of December in rabi	2	2.5	15	18.75	63	78.75
6. Formation of alleyways (30 cm for every 2-3 meters)	68	85.0	6	7.5	6	7.5
7. Nitrogen fertilizers need to be applied in splits as per the recommendation	7	8.75	49	61.25	24	30.0
8. Regular cleaning of the bunds by removing the weeds	49	61.25	21	26.25	10	12.5
9. Water management	0	0.0	11	13.75	69	86.25
10. Controlling the pest and diseases by removing the drainage water from the fields	6	7.5	14	17.5	58	72.5
11. Adopt the community approach to manage rodents	4	5.0	32	40.0	44	55.0
12. Harvesting the crop to the ground level	2	2.5	15	18.75	63	78.75
MECHANICAL PRACTICES						
13. Clipping of leaf tips before transplanting to eliminate eggs of stem borer and rice Hispa	3	3.75	7	8.75	70	87.5
14. Installation of pheromone traps to @ 4/ac to monitor YSB	2	2.5	5	6.25	73	91.25
BIOLOGICAL CONTROL						
15. 2-3 releases of egg parasitoids Trichogramma @20,000 per acre with in 30-45 DAT	0	0.0	0	0.0	80	100.0
16. Spray decisions based on the ratio of harmful insects and beneficial insects with in 2:1	0	0.0	6	7.5	74	92.5
CHEMICAL CONTROL						
17. Pest management at nursery	21	26.25	51	63.75	8	10.0
18. Using botanicals like neem oil or NSKE	2	2.5	3	3.75	75	93.75
19. Resort to spray applications only when pest population exceeds threshold limits	3	3.75	9	11.25	68	85.0
20. Correct chemical need to be sprayed at right time using right method when pest population exceeds threshold limits	6	7.5	15	18.75	59	73.75

adopted timely transplantings (78.75%), water management (86.25%) practices and removing drainage water from the field to control pests and diseases (72.50%) as per recommendations. This might be due to late release of canal water and improper drainage facilities. Hence, irrigation department need to take necessary action in releasing water at right time to start the crop season and providing good drainage facilities to farmers.

Mechanical Practices:

Great majority of the paddy farmers were not adopting clipping of leaf tips before transplantings (87.50%) and installation of pheromone traps (91.25%) for trapping male moths to prevent mating of insects and similar with the findings of Suleman Khan *et al.,* 2002. The reasons for non-adoption were that majority farmers were unaware of importance and necessity of these practices; hence there is every need to educate them on these IPM practices by organizing awareness programmes.

Biological Control:

It was observed that cent per cent of the farmers were not adopting recommended biological control practices like releasing *Trichogramma* egg parasitoids to parasitize the eggs of paddy stem borer and leaf folder (100.0%) and observing harmful and beneficial insect ratio before going for pesticide spray (92.5%). This is because of lack of knowledge on biological control and also due to non-availability of parasitoids locally to the farmers. So efforts need to be put forth for encouraging the farmers to attend more number of trainings and grasp well while attending the trainings in addition to improving their socio-political participation and mass media utilization. Also, state Agricultural University and State department of Agriculture should establish more bio-agent production laboratories to meet the demands of farmers.

Chemical Control:

More than half (63.75%) of the farmers were partially adopting pest management at nursery. The reason behind this was if any pest / disease affect the rice nurseries, it hinders the growth of seedlings and they will spread to the main field after transplantation of diseased seedlings. As a result, majority of the farmers adopted the recommended plant protection chemicals at nursery stage. However, great majority (93.75%) of the farmers were not using botanicals like Neem Seed Kernel Extract or commercially available neem formulations due to lack of confidence in using botanicals as they may not cause knock down effect of pests like the chemical pesticides. Majority of the farmers were not adopting the practices of spraying only when pest population exceeds economic threshold (ET) limits (85.5% and using correct chemical at right time using right method (73.75%). The reason may be that since IPM technologies are sophisticated and latest technologies which include identification of pests and beneficials and following ET levels for pest monitoring, lack of methods for easy detection of the pest ET levels might not have been properly understood by majority of the farmers.

Conclusion:

The study revealed that more than half of the paddy farmers exhibited medium level of adoption of IPM technologies. So for popularizing the IPM in a big way, organization of educational activities using combination of extension methods will enhance the adoption of recommended IPM practices by paddy farmers besides providing required inputs in the local area so as to enlist higher adoption rates of IPM in paddy that further leads to reduced costs, enhanced production and productivity and pollutant free paddy.

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