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A B S T R A C T

Green revolution in our country, while ushering in the much-needed self-sufficiency in food production also paved way for intensive use of harmful chemical pesticides. Excessive and indiscriminate use of these chemicals played havoc with our agro ecosystems, caused numerous problems and hazards to man and his environment besides inducing resistance in insects and undesirable residues in the food stuff. One of the best alternative methods of approach to pest control is achieved by replacing the chemical pesticides by products derived from plants. These plant products also known as botanical pesticides being non persistent and biodegradable contribute admirably to the preservation of ecosystem. Among the plant products neem-based botanical pesticides occupy a unique position and these emerged as viable alternative to chemical pesticides. Today more than three dozen commercial formulations of neem are available in the Indian market. Besides neem, nearly 500 compounds derived from 275 plant species were found to have pesticidal properties. The principal barriers to commercialization of botanical pesticides include the relative scarcity or availability of the natural resources, standardization of extract and quality control based on active ingredients and special problem in regulatory approval of botanicals. A study was conducted in Pudukottai district to find out the adoption of botanical pesticides. The data were collected from 120 farmers. More than half of the respondents were found with medium level of adoption. The occupational status showed a positive and significant relationship with extent of adoption.

***Key words*:** Adoption, Neem, Pesticide, Principal barriers, Respondents

Paddy (*Oryza sativa*) is the steady nourishment for 65 per cent of the population in India. It is the biggest burned-through calorie source among the food grains. With a for every capita accessibility of 73.8 kg it meets 31 per cent of the absolute calorie necessity of the populace. India is the second biggest maker of rice on the planet close to China [1]. In India paddy involves the primary spot both in region and creation. *Oryza sativa*, it is accepted, is related with wet, damp environment, though it's anything but a tropical plant. It is presumably a descendent of wild grass that was undoubtedly developed in the lower regions of the far Eastern Himalayas. Another way of thinking accepts that the rice plant may have started in Southern India, at that point spread toward the north of the country and afterward onwards to China [2]. It at that point showed up in Korea, the Philippines (around 2000 B.C.) and afterward Japan and Indonesia (about B.C.). At the point when Alexander the Great 2 attacked India in 327 B.C., it is accepted that he returned rice to Greece. Bedouin voyagers took it to Egypt, Morocco and Spain and that is the way it traversed Europe, Portugal and Netherlands took rice to their provinces in West Africa and afterward it made a trip to America through the 'Columbian Exchange' of normal assets. Yet, as is customarily known, rice is a sluggish starter and this is additionally consistent with the way that it required near two centuries after the journeys of Columbus for rice to flourish in the America. From that point the excursion of rice proceeds with the Moors taking it to Spain in 700 A.D and the Spanish carried rice to South America toward the start of seventeenth century.

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MATERIALS AND METHODS

Extent of adoption refers to measure how for the particular technology was adopted by an individual correctly without distortion of message. Rogers [3] (1983) defined adoption as a decision to make use of an innovation as the best course of action available. In this study, 35

recommended paddy technologies were selected for studying the extent of adoption. Each individual was asked about adoption and non- adoption against each item. The score of two was given for adoption and non-adoption received one score. The scores for all these items were added up for each respondent and total adoption score was arrived at. The formula for adoption index by Suhirdha [4] (2009) was followed in this study. The score was obtained for each of the recommended items by adding the score obtained by the individual farmer on each item and indices were worked out. The items of the recommended practices were also categorized into low, medium and high by adopting percentage analysis.

RESULTS AND DISCUSSION

Adoption is a decision to make use of an innovation as a best course an action available (Rogers, 1983). It is necessary to study the extent of recommended technologies in paddy cultivation. Therefore, the data with regard to overall adoption and practice-wise adoption were collected.

Overall adoption of recommended paddy cultivation technologies

The distribution of respondents according to overall adoption of recommended paddy cultivation technologies are furnished in (Table 1).

Table 1 Distribution of respondents according to their overall adoption level of recommended paddy technologies (n=120)

Category	Number of respondents	Per cent
Low	30	25.00
Medium	69	57.50
High	21	17.50
Total	120	100

It could be understood from Table 1 that a more than half of the respondents (57.50 per cent) had medium level of adoption of recommended paddy technologies followed by 25.00 per cent of the respondents with low level of adoption. Only 17.50 per cent of the respondents fell under high level of adoption. Medium level of experience in paddy farming, social participation, extension agency contact, mass media exposure, information seeking behaviour, social participation, innovativeness, and economic motivation and risk orientation would have been the reasons for majority of them to belong to medium level of adoption category [5].

Practice wise adoption level of the respondents on recommended paddy technologies

In order to have an in-depth idea about adoption level of the respondents, a practice wise adoption level of the respondents was worked out. The practice-wise adoption level of the respondents on selected technologies on paddy cultivation and the results are given in (Table 2).

Season

It could be seen from (Table 2) that season was found to be adopted by all the respondents (100.00 per cent). This might be due to the knowledge of the respondents about climate conditions prevailing in this tract. Moreover, the farming experience of the respondents would have enabled them to adopt the correct season for sowing of paddy [6].

Variety

Varieties are very important for getting higher yield. It could be observed from (Table 2) that 90.83 per cent of the respondents adopted the recommended varieties. This might be due to the high knowledge level of the respondents on recommended varieties.

Seed rate

It could be seen from (Table 2) that 60.00 per cent of respondents adopted the recommended seed rate whereas 40.00 per cent of the respondents did not adopt the practice. Some of the respondents felt that there may be the possibility of loss of seedlings during germination due to heavy rain, hence they have adopted higher seed rate than the recommended quantity. This might be the probable reason for non-adoption of recommended seed rate by 40.00 per cent of the respondents [7].

Seed treatment

The mean adoption score of 37.92 per cent was observed for seed treatment practices namely recommended fungicide (43.33 per cent), recommended quantity of fungicide (31.67 per cent), recommended bio-fertilizer (40.83 per cent) and recommended quantity of bio-fertilizer (35.83per cent). The medium adoption might be due to the low annual income, lack of skill, non-availability of fungicides and the unfavourable results of seed treatment visualized by the farmers in the past [8].

Plant population

The mean adoption level for plant population was found to be 38.89 per cent. It could be inferred that half of the respondents had adopted recommended size of the nursery area required per ha (52.50 per cent) followed by number of hills per metric square (37.50 per cent) and 26.67 per cent had adopted the recommended seedlings planted per hill. The remaining two-fifth of the respondents were not to take risk and also viewed that excess plant population would result in higher yield. Hence some of the respondents did not adopt the recommended plant population [9].

Spacing

Adoption of recommended spacing is very much important to get optimum plant population. More than sixty per cent of the respondents adopted the practice recommended spacing (60.00 per cent) between plants. As majority of the respondents had knowledge of recommended spacing, they might have adopted this practice [10].

Fertilizer management for nursery

The mean adoption percentage for fertilizer management for nursery is 42.49 per cent. The recommended practices on fertilizer management for nursery viz., recommended quantity of FYM per nursery area per ha (44.16 per cent) and recommended quantity of N,P,K for nursery area (40.83 per cent) are found to be low. This might be due to the non-availability of required FYM at the time of sowing, high cost of FYM due to decreasing cattle population and non-availability of labour for application and high cost of fertilizer [11-12].

Main field preparation

The mean adoption score for preparation of main field was found to be 36.39 per cent. More than one third of the respondents (35.00 per cent) had adopted recommended

number of ploughings per hectare and 40.83 per cent of the respondents had adopted the method of land preparation. The medium level of adoption might be due to their medium level of experience in paddy cultivation [13].

Table 2 Distribution of respondents according to their practice wise adoption on recommended paddy technologies

S. No	Technologies	(n=120)	
		No. of respondents	Per cent
I	Season		
1.	Recommended season	120	100.00
II	Variety		
1.	Recommended varieties of paddy	109	90.83
III	Seed rate		
1.	Recommended seed rate	78	65.00
IV	Seed treatment		
1.	Recommended fungicides	52	43.33
2.	Recommended quantity of fungicides	38	31.67
3.	Bio-fertilizers recommended for seed treatment	49	40.83
4.	Quantity of bio-fertilizer per hectare for seed treatment	43	35.83
	Mean percentage		37.92
V	Plant population		
1.	Size of the nursery area required per hectare	63	52.50
2.	Nursery of hills per metric square	45	37.50
3.	Recommended seedling planted per hill	32	26.67
	Mean percentage		38.89
VI	Spacing		
1.	Recommended spacing	72	60.00
VII	Fertilizer management for nursery		
1.	Recommended quantity of FYM/nursery area/ha	53	44.16
2.	Recommended quantity of N,P,K for nursery area	49	40.83
	Mean percentage		42.49
VIII	Main Field preparation		
1.	Method of land preparation	49	40.83
2.	Recommended number of ploughing/ha	42	35.00
3.	Recommended quantity of FYM/ha	40	33.33
	Mean percentage		36.39
IX	Irrigation management		
1.	Recommended maintenance of water level from transplantation to tillering stage	87	72.50
2.	Recommended time of irrigation	59	49.16
3.	Recommended water level after panicle initiation till maturity	56	46.67
	Mean percentage		56.11
X	Fertilizer management for main field		
1.	Stages of application of fertilizers	74	61.67
2.	Recommended doses of N,P,K/ha for basal application	65	54.16
3.	Recommended doses of N,K/ha for top dressing	43	35.83
	Mean percentage		50.55
XI	Weed management		
1.	Recommended time for first weeding	66	55.00
2.	Recommended time for second weeding	53	44.16
3.	Recommended herbicides	49	40.83
4.	Quantity of recommended herbicides	42	35.00
	Mean percentage		43.75
XII	Pest management		
1.	Recommended pesticide for the management of BPH	46	38.33
2.	Recommended quantity of pesticide for controlling BPH	32	26.67
3.	Recommended pesticide for the management of stem borer	27	22.50
4.	Recommended quantity of pesticide for controlling stem borer	23	19.16
5.	Recommended number of light traps per ha	63	52.50
6.	Recommended pesticide for the management of gall midge	48	40.00
	Mean percentage		33.19
XIII	Disease management		
1.	Recommended fungicide for controlling of Leaf blast	46	38.33
2.	Recommended quantity of fungicide for controlling of leaf blast	37	30.83
	Mean percentage		34.58
XI	Harvesting		
1.	Recommended time of harvesting	98	81.67

Irrigation management

The mean adoption percentage for irrigation management was found to be 56.11 per cent. Out of three irrigation management practices, the practice namely, recommended time of irrigation was round to be adopted by (49.16 per cent) of the respondents. The recommended maintenance of water level from transplantation tillering stage was found to be adopted by nearly one fourth of the respondents (72.50 per Cent) and only 46.67 per cent of the respondents adopted recommended water level after panicle initiation till maturity [14]. The probable reason for non-adoption might be due to the insufficient water supply and also due to the electricity problems faced by the respondents.

Fertilizer management for main field

The mean adoption level of fertilizer management was found to be 50.55 per cent. More than fifty per cent of adoption level was observed for stages of application of fertilizers (61.67 per cent) and adoption level was observed for recommended doses of N,P,K per ha for basal application (54.16 per cent) and only 35.83 per cent adoption level was observed on recommended doses of N,P,K per ha for top dressing [15-16]. The invisible impact of fertilizer and low level of knowledge on fertilizer management might be the probable reasons for medium adoption by the respondents.

Weed management

The mean adoption level on weed management was found to be low (43.75 per cent). The recommended time for first weeding was found to be adopted by 55.00 per cent followed by recommended time for second weeding was found to be adopted by 44.16 per cent. Recommended herbicide application, correct quantity of herbicide was adopted by 40.83 per cent and 35.00 per cent of the respondents respectively. The high cost of chemicals, non-availability of labourers and the importance of weedicide not felt by the farmers due to incomplete information may be attributed as the reasons for non-adoption of weedicide [17].

Pest management

The mean adoption level on pest management was found to be low (33.19%). More than fifty per cent of the respondents had adopted the recommended number of light traps per ha (52.50%). Less than fifty per cent of the respondents had adopted the recommended practices viz., pesticides recommended for the management of BPH (38.33%), recommended pesticides for the management of gall midge (40.00%), recommended quantity of pesticide for controlling of BPH (26.67%), recommended pesticide for the management of stem borer (22.50%), recommended quantity of pesticide for controlling of stem borer (19.16%). Lack of knowledge about pest management techniques, doses of chemicals and non-availability of labour and high cost of chemicals might be the reasons for non-adoption.

Disease management

The mean adoption level on disease management was found to be 34.58 per cent. The recommended fungicide for controlling of leaf blast was found to be 38.33 per cent and recommended quantity of fungicide for controlling of leaf blast was found to be 30.83 per cent. Unawareness about disease management techniques, dosage of chemicals non-availability of labour and high cost of chemicals might be the reasons for non-adoption.

Harvesting

From the (Table 2) it could be seen that majority of the respondents (81.67 per cent) had adopted the recommended time for harvesting in paddy cultivation. The farmers are well aware of the right time of harvest due to their rich experience in paddy cultivation. Moreover, they opined that the rice husks have to be harvested in time so as to ensure better quality and better price for the produce.

Relationship between profile characteristics of the paddy growers with their extent of adoption

The results on correlation and regression analysis of characteristics of respondents with adoption of paddy growers are presented in (Table 3).

Table 3 The relationship between characteristics of the paddy growers with their extent of adoption (n=120)

Var. No	Variables	'r' value	Regression co-efficient	Standard error	't' value
X_1	Age	0.203^{*}	3.145	1.095	2.652^{**}
X_2	Educational status	0.217^{*}	1.400	0.643	2.174^{*}
X_3	Farm size	0.087^{NS}	0.021	0.046	0.193^{NS}
X_4	Experience in paddy farming	0.138^{NS}	0.120	0.113	1.329^{NS}
X_5	Annual income	0.252^{*}	0.800	0.471	1.798^{*}
X_6	Social participation	0.275^{**}	2.100	1.050	2.000^{*}
X_7	Extension agency contact	-0.003^{NS}	0.064	0.190	0.694^{NS}
X_8	Mass media exposure	0.213^{*}	0.076	0.065	0.783^{NS}
X_9	Information seeking behaviour	-0.086^{NS}	-0.128	0.072	-1.253^{NS}
X_{10}	Innovativeness	-0.053^{NS}	-0.002	0.057	0.012^{NS}
X_{11}	Scientific orientation	0.034^{NS}	0.132	0.023	1.278^{NS}
X_{12}	Economic motivation	0.034^{NS}	0.083	0.473	0.932^{NS}
X_{13}	Risk orientation	-0.081^{NS}	0.003	0.121	0.036^{NS}
X_{14}	Decision making pattern	0.053^{NS}	0.041	1.542	0.430^{NS}

**Significant at 1 per cent level
*Significant at 5 per cent level

$R^2 = 0.532$
$F = 8.168^{**}$

Association of characteristics of respondents with their adoption level of paddy growers.

It could be observed from (Table 3) that out of fourteen variables studied, age, educational status, annual

income and mass media exposure had positive and significant relationship at five per cent of probability and one variables namely social participation had positive significant relationship at one per cent level of probability with the adoption level of paddy growers. All other variables were found to be non-significant [18].

CONCLUSION

From this study it is concluded that the adoption is medium. This is due to their low knowledge level. So we have to increase the knowledge by conducting more trainings and through the mass media.

LITERATURE CITED

1. Gogoi M, Phukan E. 2000. Extent of adoption of improved rice cultivation practices by farmers. *Maharashtra Journal of Extension Education* 19: 190-193.
2. Singh AK, Baruah MJ. 2017. Farmers' adoption behaviour in rice technology: An analysis of adoption behaviour of farmers in rice technology under different farming systems in Assam. *Journal of Human Ecology* 35(3): 167-172.
3. Rogers EM. 1983. *Diffusion of Innovations*. The Free Press, New York. pp 453.
4. Suhirdha P. 2009. A study on adoption of pest management technologies by tomato growers in Mettur taluk of Salem district. *Unpublished M. Sc. (Agriculture) Thesis*, Annamalai University, Annamalainagar, Tamil Nadu.
5. Manikandan K. 2010. Information and skill need of farmers on system of rice intensification. *Unpublished M. Sc. (Agriculture) Thesis*, Annamalai University, Annamalainagar, Tamil Nadu.
6. Mugambika K. 2012. Training needs of agricultural labourers. *Unpublished M. Sc. (Agriculture) Thesis*, Annamalai University, Annamalainagar, Tamil Nadu.
7. Dubey SK, Sawarnkar VK. 1992. Knowledge and adoption of the rice production technology among small and marginal farmers. *Maharashtra Journal of Extension Education* 11: 79-84.
8. Mullaivendan S. 2012. A study on yield gap and constraints to high yields in rice at farm level in Srikali Taluk, Nagapattinam District. *Unpublished M. Sc. (Agriculture) Thesis*, Annamalai University, Annamalainagar, Tamil Nadu.
9. Moktan, Sidhartha D, Mukhopadhey. 2012. Nature and extent of participation of farm women and their economic contribution in agriculture- A case study in hills district of West Bengal. *Indian Journal of Extension Education* 21(2): 1-9.
10. Rao GA, Singh SN. 1980. Farmer's characteristics and adoption of high yielding rice varieties in two villages. *Oryza* 17(3): 223-227.
11. Kavaskar M, Govind S. 2020. Factors influencing symbolic adoption behaviour of paddy growers on organic farming practices. *Plant Archives* 20(1): 2956-2960.
12. Manikandan K. 2013. Learning experience and extent of adoption of paddy farmers in Ariyalur district. *Unpublished M. Sc. (Agriculture) Thesis*, Annamalai University, Annamalainagar, Tamil Nadu.
13. Singh MM. 2009. Depiction of indigenous technological knowledge (ITK) in agricultural aspects prevailing in Gwalior region of Madhya Pradesh. *Unpublished M. Sc. (Agriculture) Thesis*, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh.
14. Narasimhan R. 2014. Awareness, knowledge and adoption behaviour of eco-friendly agricultural practices in Perambalur district of Tamil Nadu. *Unpublished M. Sc. (Agriculture) Thesis*, Annamalai University, Annamalainagar, Tamil Nadu.
15. Rahangdale PK. 2019. An analysis of adoption behavior of hybrid rice grower in Balaghat District of Madhya Pradesh. *International Journal of Humanities and Social Science Invention* 8(10): 05-07.
16. Mariammal R, Seethalakshmi M. 2017. Entrepreneurial behaviour of dairy farm women in Dindigul district of Tamil Nadu. *International Journal of Science, Environment and Technology* 6(4): 2539-2547.
17. Painkra SK, Nag SK, Kirar BS. 2004. Adoption of recommended rainfed rice production technology by the farmer of Tokapal block of Bastar District, Chhattisgarh. *In*: IRRI (Abstract). pp 263.
18. Roy S, Bhagat R, Rao DUM. 2007. Level of knowledge and extent of adoption of farmers on recommended gladiolus production practices. *Indian Research Journals of Extension Education* 7(2/3): 69-71.