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Knowledge about IPM among paddy growers of Mehmedabad Taluka in Kheda district

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Abstract

Keeping in view the importance of Integrated Pest Management (IPM) in paddy, a study was conducted in Mehmedabad Taluka of Kheda district (Gujarat) with an objective to find out the knowledge level of IPM practices among paddy growers. Primary data were collected from 100 respondents from five villages of Mehmedabad Taluka using random sampling method. Well-structured and pre-tested interview schedule was used for data collection, using personal interview. The study revealed that majority (45.00%) of respondents was belonging to middle age group. More than one third (35.00%) of respondents were belonging to young age and only 20.00 percent of farmers were belonging to old age group. It was found that Equal percentages (30.00 percent) had higher secondary as well as Secondary level of education followed by 18.00 percent from them had graduate level of education. Slightly more than one third (41.00 percent) of the respondents having medium size (2.1 to 4 ha) of land holdings followed by 31.00 percent of the respondents having large size of land holding (> 4 ha). The study showed that 40.00 percent of the respondents were dependent on farming and animal husbandry while, 30.00 percent of the respondents engaged in farming, labor and animal husbandry. Nearly two fifth (42.00 percent) of the respondents had Rs. 2,00,001/- to 4,00,000/- income per year. The study revealed that half (50.00 percent) of the respondents found in very low category of knowledge of overall IPM. Only 15.00 percent of the respondents found in high level category of knowledge of overall IPM. Only 13.00 percent of the respondents found in low category of knowledge of overall IPM. Only 13.00 percent of the respondents were found in medium category of knowledge of overall IPM. Only 9.00 of the respondents were found in very high category of knowledge of overall IPM.

Keywords: Knowledge, IPM, Paddy growers, Mahemdavad

Introduction

Rice (*Oryza sativa* L.) is one of the most important cereal crops and is grown in approximately 148 million hectare of land globally. Rice is an important Kharif crop of kheda district of Gujarat. From nursery phase to harvesting of rice it is attacked by several types of insects, pests and diseases causing enormous grain yield losses, which may vary from 20- 50% (Jamwal *et al.*, 2020) [1]. For minimising losses and to increase the profitability, farmers generally use chemical pesticides. In view of more use of chemical pesticides by farmers which cause environmental pollution, Integrated Pest Management (IPM) is an effective and environment-friendly pest management system. IPM is an eco-friendly approach for managing pest and diseases utilizing all available techniques and methods such as Cultural, mechanical, biological and chemical methods to suppress the pest population below economic threshold level. IPM has been introduced as a sustainable approach for preventing, monitoring and controlling pests (Olkowski, 1991) [4]. Thus, IPM not only helps in minimizing pest population ecologically but is also helpful for the growers economically and conclusively in agribusiness. But due to lack of knowledge about IPM practices farmers are not adopting these practices. Keeping in view, the present study was planned in paddy growing area of Mehmedabad Taluka of Kheda district (Gujarat) with objectives:

1. To study the profile of paddy growers of Mehmedabad Taluka of Kheda District
2. To assess the knowledge level of farmers regarding Integrated Pest Management.

Methodology

A multistage sampling technique was adopted for selection of samples. The study was conducted in Kheda district during 2019. The Kheda district is comprises of 10 blocks. Out of 10 blocks; Mahemdavad block was selected purposively because it served a great deal of convenience for the research worker for accessibility, easy of rapport buildings, time and education level of farmer.

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For selection of villages, a list of villages comes under these blocks was prepared and 5 villages viz., Devaki Vansol, Amrapur, Sojali, Shetruda and Keshara) from Mahemdavad block were selected. After the selection of villages, village wise list of farmers were prepared and among them 20 respondents from each village were selected on the basis of random sampling methods. Thus, the total 100 respondents were drawn for sample size. The data were collected through a well-structured and pre-tested interview schedule which was prepared on the basis of the objectives of the study in Gujarati. The researchers were personally met to the respondents and explained to them about the purpose of the study. The data were collected and recorded in free and frank atmosphere where the interviewer and interviewee had a good rapport. The data collected were tabulated and presented in the form of tables and figures as per necessity. Data collected were qualitative as well as quantitative. The quantitative data were interpreted in terms of percentage and qualitative data were tabulated on the basis of categorization methods. After tabulation, statistically tools like frequency, percentage and mean were used. One score is given for correct answer of statement and zero score is given for wrong answer. Five part

of maximum score (Total score) of correct answer is made to divide Very low, low, medium, high and very high knowledge level of the respondent.

Result and Discussion

The data presented in Table 1 revealed that majority (45.00 percent) of farmers were belonging to middle age group. More than one third (35.00 percent) of respondents were belonging to young age and only 20.00 percent of farmers were belonging to old age group. Equal percentages (30.00 percent) had higher secondary as well as secondary level of education followed by 18.00 percent from them had graduate level of education. Slightly more than one third (41.00 percent) of the respondents having medium size (2.1 to 4 hectare) of land holdings followed by 31.00 percent of the respondents having large size of land holding (> 4 ha). The finding revealed that 40.00 percent of the respondents were dependent on farming and animal husbandry while, 30.00 percent of the respondents engaged in farming, labor and animal husbandry. Nearly two fifth (42.00%) of the respondents had Rs. 2,00,001/- to 4,00,000/- income per year.

Table 1: Personal and socio-economic characteristics of the farmers using ICT tools (n= 100)

Sr. No.	Characteristics	Frequency	Percent
1.	Age		
	i. Young Age (up to 35 years)	35	35.00
	ii. Middle Age (35 to 50 years)	45	45.00
	iii Old Age (Above 50 years)	20	20.00
2.	Education		
	i. Illiterate	01	01.00
	ii. Primary education (up to v std.)	07	07.00
	iii Primary education (vi to viii Std.)	14	14.00
	iv. Secondary education(viii to x)	30	30.00
	v. Higher secondary(xi to xii)	30	30.00
3.	Land holding		
	i. Marginal (Up to 1 hectare)	09	09.00
	ii. Small (1.1 to 2 hectares)	19	19.00
	iii Medium (2.1 to 4 hectare)	41	41.00
	iii. Large (Above 4 hectares)	31	31.00
4	Occupation		
	Farming only	04	04.00
	Farming and labour	05	05.00
	Farming and service	09	09.00
	Farming and business	12	12.00
	Farming and animal husbandry	40	40.00
	Farming, labour and animal husbandry	30	30.00
5	Income in Rs.		
	Upto Rs. 50000	05	05.00
	Rs. 50001 to Rs.100000	16	16.00
	Rs 100001 to Rs.200000	21	21.00
	Rs 200001- to Rs.400000	42	42.00
	Above Rs. 400000	16	16.00

Knowledge level of paddy growers regarding integrated pest management

The productivity in Paddy is depends on knowledge possesses by the farmers in paddy farming. Knowledge possess by the farmers in paddy farming have been categorized as under.

Knowledge of the respondents about stem borer IPM

Damage: Egg laying on leaf, freshly hatched larvae move down to leaf sheath and feed on inner tissue, with the

advancement of growth and development larvae bore into stem bore into stem and feed on inner surface. Due to such feeding at vegetative stage the central leaf whorl unfold, turns brown and dries up which is termed as Dead Heart. Infestation after the panicle initiation, result in drying of panicle which may not emerges at all and those that have already emerges do not produce grain and appears as white head.

A distribution of the respondents according to their level of

knowledge regarding Integrated Pest Management in stem borer IPM knowledge for paddy farming is presented in Table 2.

Table 2: Distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of Stem borer n = 100

Sr. No.	IPM components	Number	Percentage
1	Forewing colour of female moth	37	37.00
2	Colour of spot on larva	27	27.00
3	Colour of male moth	30	30.00
4	Forewing identity	25	25.00
5	Colour of immature larva	43	43.00
6	Colour of mature larva	37	37.00
7	Colour of head of mature larva	38	38.00
8	Length of mature larva	52	52.00
9	Site of egg laying by female moth	56	56.00
10	Local terminology of identification of white coloured tiller infestation and no grain formation	24	24.00
11	Resistant paddy variety	56	56.00
12	Appropriate time of sowing of paddy nursery for less infestation	47	47.00
13	Card for control	6	06.00
14	Trap to attract	2	02.00
15	Trap number per acre	10	10.00
16	Name of trap which attract pests by its light	47	47.00
17	Activity to be done after harvesting to destroy egg and caterpillar	60	60.00
18	Days after transplanting of paddy, application of chemical insecticide	50	50.00
19	Insecticide name and dose	29	29.00
20	Practices to be followed before transplanting	40	40.00

Majority (60.00%) of the respondents were possessing knowledge of “Activity to be done after harvesting to destroy egg and caterpillar”, More than one half (56%) of the respondents were possessing knowledge of “site of egg laying by female moth” and “Resistant paddy variety”. Nearly half (52.00 percent) of the respondents were possessing knowledge of “Length of mature larva”.

Knowledge of the respondents about Paddy armyworm

A distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of Paddy armyworm is presented in Table 3.

Table 3: Distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of Paddy armyworm (n= 100)

Sr. No.	IPM component	Number	Percentage
1	Marks of identification of paddy armyworm	44	44.00
2	Nature of damage	56	56.00
3	Depth of trenches to be made	13	13.00
4	Things to be kept at evening to collect	10	10.00
5	Quantity of Neem cake to be apply as basal application	03	03.00
6	Quantity of wood ash should be add with sand to broadcast in a acre of land	02	02.00
7	Quantity of methyl parathion 2% or carbaryl 5% dust	37	37.00

More than one half (56.00 percent) of the respondents were

possessing knowledge of “Nature of damage”. Less than half (44.00%) of the respondents were possessing knowledge of “Marks of identification of paddy armyworm”.

Knowledge of the respondents about paddy plant hoppers

Nymph and adult Causes damage by sucking cell sap from the leaf which turn yellow. If insect attack during early stage of growth, the entire plant may dry up. Under favourable condition of high humidity, optimum temperature, high nitrogen application and no wind, the population increases very rapidly and a hopper burn is observed in localities giving brownish hopper burn appearance of field. A distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of plant hoppers is presented in Table 4.

Table 4: Distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of Paddy plant hoppers n = 100

Sr. No.	IPM component	Number	Percentage
1	Colour of hoppers	70	70.00
2	Nature of damage of hoppers	57	57.00
3	Field appearance due to damage	53	53.00
4	Resistant varieties	45	45.00
5	Transplanting time	10	10.00
6	Number of splits of nitrogenous fertilizer to be applies to avoid/minimize plant hoppers incidence.	15	15.00
7	Name of granular insecticide to be applied with sand after draining of water from paddy field to minimize hopper incidence	09	09.00

Nearly one third (70.00 percent) of the respondents were possessing knowledge of” Colour of hoppers”, majority (57.00 percent) of the respondents possessing knowledge of nature of damage of hoppers. Nearly half (53.00 percent) of the respondents were possessing knowledge of field appearance due to damage.

Knowledge of the respondents about other pests (leaf hopper, paddy skipper, ear head bug and blue beetle)

A distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of leaf hopper, paddy skipper, ear head bug and blue beetle is presented in Table 5.

Table 5: Distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of Leaf hopper, paddy skipper, Ear head bug and blue beetle n = 100

Sr. No.	IPM component	Number	Percentage
1	Colour of wing of adult leaf hopper	30	30.00
2	Symptoms on leaf after leaf hopper damage	35	35.00
3	Marks of identification of paddy skipper	7	07.00
4	Nature of damage of paddy skipper	5	05.00
5	Colour of adult of ear head bug	30	30.00
6	Name of effective insecticide being used at the time of initiation of incidence of ear head bugs	21	21.00
7	Colour of larva of blue beetle	12	12.00
8	Colour of adult of blue beetle	6	06.00
9	Due to blue beetle damage either side of leaf mid rib, colour patches observed on leaf	12	12.00

Nearly one third (35%) of the respondents were possessing knowledge of ”Symptoms on leaf after leaf hopper damage”,

nearly one third (30.00 percent) of the respondents were possessing knowledge of “colour of wing of adult leaf hopper” and nearly one third (30.00 percent) of the respondents were possessing knowledge of “colour of adult of ear head bug”.

5. Knowledge of the respondents about non-insect pests (crab, rodent and birds)

A distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of crab, rodent and birds is presented in Table 6.

Table 6: Distribution of the respondents according to their level of knowledge regarding Integrated Pest Management of non-insect pests (crab, rodent and birds) (n= 100)

Sr. No.	IPM component	Number	Percentage
1	Insecticide name to control crabs	0	00.00
2	Rodenticide name for the management of rat	6	06.00
3	Activity to be done to avoid bird damage	63	63.00

Majority (60.00 percent) of the respondents were possessing knowledge of “Activity to be done to avoid bird damage” Only 6.00 percent of the respondents was possessing knowledge of “Rodenticide name for the management of rat”.

6. Overall IPM knowledge

A distribution of the respondents according to their level of knowledge regarding overall Integrated Pest Management is presented in Table 7.

Table 7: Distribution of the respondents according to their level of knowledge regarding overall Integrated Pest Management (n= 100)

Sr. No.	Category	Range	Stem borer (%)	Paddy armyworm (%)	Paddy plant hoppers (%)	Other pests (%)	Non-insect pests (%)	Overall (%)
1	Very Low	0 to 20	50	56	42	70	35	50
2	Low	21 to 40	10	07	05	09	61	13
3	Medium	41 to 60	11	27	38	09	00	13
4	High	61 to 80	19	07	05	06	04	15
5	Very high	80 to 100	10	03	10	06	00	09
Total			100	100	100	100	100	100

Half (50.00 percent) of the respondents were found in very low category of knowledge of stem borer IPM. Two fifth (20.00 percent) of the respondents have low knowledge of stem borer pest. Majority (56.00 percent) of the respondents were possessing very low category of knowledge of paddy armyworm integrated pest management. Nearly one fifth (27.00 percent) of the respondents were possessing medium level of knowledge of paddy armyworm integrated pest management. Nearly two fifth (42.00 percent) of the respondents were possessing medium level of IPM knowledge of paddy plant hoppers. Nearly one fifth (70.00 percent) of the respondents were possessing very low level of IPM knowledge of leaf hopper, paddy skipper, ear head bug and blue beetle of paddy. Majority (61.00 percent) of the respondents were possessing low level of IPM knowledge of non-insect pests viz., crab, rodent and birds.

Half (50.00 percent) of the respondents found in very low category of knowledge of overall IPM. Only 15.00 percent of the respondents found in high level category of knowledge of overall IPM. Only 13.00 percent of the respondents found in low category of knowledge of overall IPM. Only 13.00 percent of the respondents were found in medium category of knowledge of overall IPM. Only 9.00 percent of the respondents were found in very high category of knowledge of overall IPM.

The present findings are also in agreement with findings of Jamwal *et al.* (2020) ^[1], Kusumawardani *et al.* (2019) ^[3] and Karamidehkordi and Hashemi (2018) ^[2].

Conclusion

The results of the study indicate that paddy growers of Mehmedabad Taluka of Kheda district are lacking in knowledge on Integrated Pest Management practices. Paddy growers have low to medium knowledge about pest identification, nature of damage, cultural practices,

mechanical practices and chemical practices. Therefore there is a need of skill oriented trainings for paddy growers regarding Integrated Pest Management to enhance the knowledge of paddy growers in the study area.

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