

Insecticide Handling Knowledge and Practices by Maize Farmers of West Godavari District of Andhra Pradesh

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ABSTRACT

The study was carried out total 30 selected farmers from six mandals viz., Pedavegi, Lingapalem, Chintalapudi, Eluru, T. Narasapuram and K. Kota of West Godavari district of Andhra Pradesh during *rabi* 2021-2022 to study their knowledge and practices towards pesticide usage. The study revealed that great majority of the farmers were unaware about pesticide classification and toxicity symbols on packing (77%), and alerts / rejection of export of food materials due to pesticide residues (47%). When contacted regarding pesticide selection, 58% responded that the selection of pesticides is based on their experience, while only 7% farmers informed that they contact local agricultural officer for recommendation / selection of pesticides. Majority of the farmers use bottle cap (63%) for measuring liquid formulations, and about 54% of them use stick for mixing the spray solution. During the personal discussions and also observations in the field, that most commonly observed symptoms are skin irritation (34%) followed by breathing problems (23%). It was also clear that 40% of the farmers followed cleaning the affected area with water in the event of pesticide poisoning. The study results indicate that there is a need to conduct simple training sessions among farmers prior to onset of crop season, focussing on safe handling and use of pesticides, with special reference to mixing, use of personal protection while spraying and simple first aid methods in case of poisoning.

Keywords: *Awareness, Pesticides, Usage and handling.*

The use of insecticides to protect crops made a substantial contribution to the yield of cereals and other crops (Damalas, 2009). For many years, a wide range of pesticides have been widely utilized in the protection of food goods. However, several challenges have developed as a result of pesticide use, primarily due to a lack of awareness or understanding (e.g., about recommended pesticide doses and safety risks) and improper application of these chemicals (Saeed *et al.*, 2017). Even farmers who are aware of pesticide's negative effects are sometimes unable to incorporate this knowledge into their methods (Damalas *et al.*, 2006).

Increased pesticide misuse in various sectors of the agriculture often has been associated with health problems and environmental contamination in worldwide (Soares *et al.*, 2003). Majority of the farmers are applied insecticides at high dosage without assessing the actual dose requirement due to inadequate knowledge and lack of awareness. Pesticides when used incorrectly can cause secondary pest outbreaks, the extinction of non-target species, soil, water, and air contamination, and residues in primary and derived agricultural products, all of which endanger both the environment and human health. Nowadays pesticide use increased in Maize fields due

to prevalence of invasive pest, fall army worm. In view of the wide spread of pesticides in Maize, a study was conducted among Maize farmers to understand and analyse their knowledge on safe and responsible use of pesticides, and the practices followed during spraying activity.

MATERIALS AND METHODS

The study was carried out in six mandals of West Godavari district *i.e.*, Eluru, Pedavegi, Lingapalem, Chintalapudi, T. Narsapuram and Kamavarapu Kota (K. Kota) in Andhra Pradesh during *rabi* 2021-2022. The data were collected through observation during field visits and also personal interactions with farmers throughout the crop season. A well-structured questionnaire was prepared in both English and Telugu languages to collect and record as much information as possible. The questionnaire mainly focused on farmers' knowledge and behaviour regarding pesticide usage patterns, such as awareness of pesticide recommendation, classification of pesticides based on toxicity symbols, pesticide residues, contact person for pesticide recommendation, measuring, mixing, disposal of empty pesticide containers, safety measures practised, pesticide effect on spray men's health; and awareness of first aid practises in case of pesticide poisoning. The telugu book was given to each farmer for recording the information, while the English version is used for recording observations through personal visits and also discussions/ meeting with each farmer.

RESULTS AND DISCUSSION

Awareness on recommended pesticides and pesticide classification

The results displayed in table 1 showed that majority of farmers (63%) are aware about the pesticide recommendations, and also recommended

pesticides on maize (Fig 1). Out of 30 farmers, 23% farmers are aware about the pesticide classification based on the toxicity and also the toxicity symbols on the packing, while 77% farmers are not having knowledge on pesticide toxicity symbols and caution messages (Table 1 and Fig 2). The relation between awareness of farmers on pesticide toxicity classification and literacy levels calculated using chi-square test, reveals that there is no relation as the P value is more than 0.05. Kumar *et al.* (2017) reported that 86.66% of the farmers in Karimnagar district were not aware about the pesticide classification based on toxicity and toxicity symbols on packing.

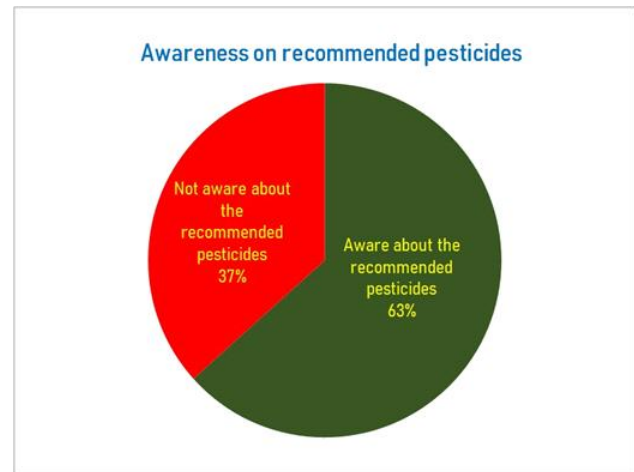


Fig 1. Awareness on recommended pesticides

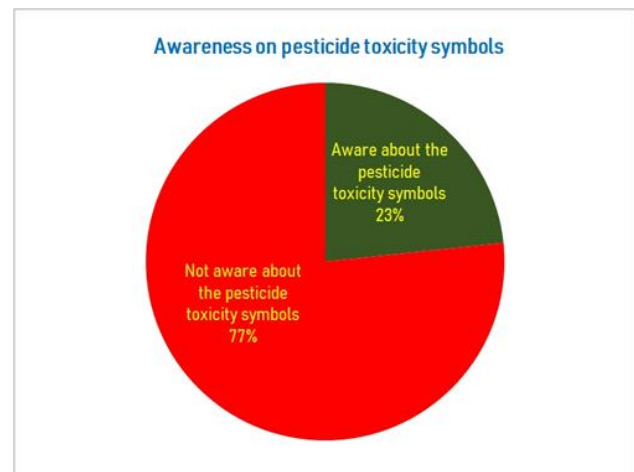


Fig 2. Awareness on pesticide toxicity symbols

Awareness on pesticide measuring, mixing and storage practices

In the present study, it was recorded that 63% of the farmers measure the pesticide with the help of bottle cap, while 27% of the farmers are measuring approximately (Table 1 and Fig 3). It was noticed that 54% of the farmers are mixing the pesticide with the help of the stick, 33% of them mixing with hand without any personal protection, and 13% responded that the mixing of the pesticides will be done either way depend on the situation (Table 1 and Fig 4). While storage of the pesticide it was noted that 57% farmers are storing the pesticide in the fields (store room or secret place) and 43% farmers are storing pesticide safely at home in protected place (Table 1 and Fig 5). The relation between awareness of farmers on pesticide measuring, mixing and storage with literacy levels calculated using chi-square test, reveals that there is no relation as the P value is more than 0.05. Singh and Gupta (2009) also concluded that 50% of the respondents are kept the pesticides containers in the field. Kumar *et al.* (2017) reported that 86.66% farmers are measuring pesticides with bottle cap and 100% mix them with the help of stick in Karimnagar district.

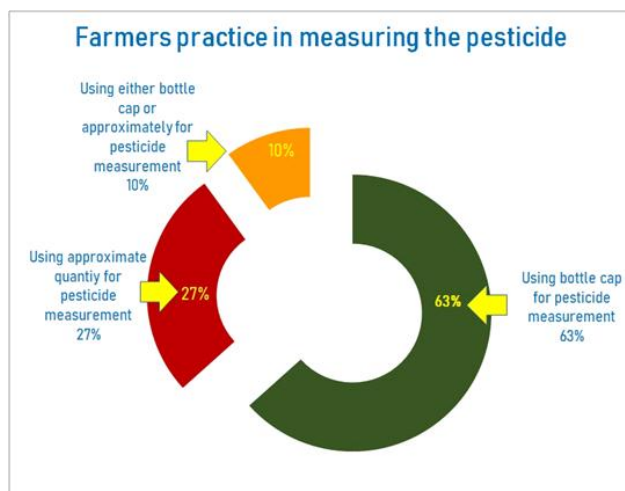


Fig 3. Farmers practice on measuring of pesticides

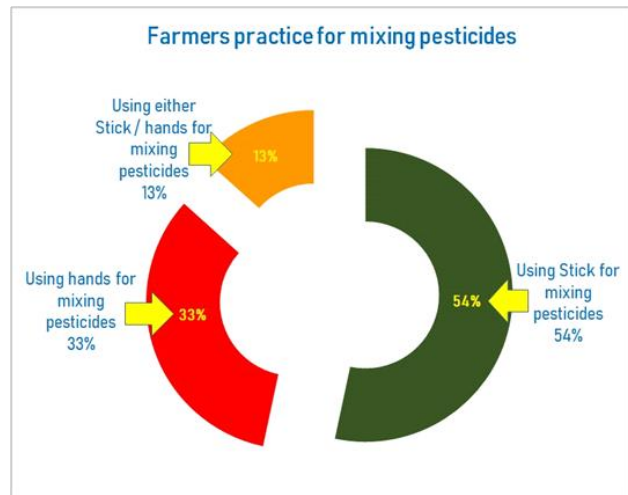


Fig 4. Farmers practice on mixing of pesticides

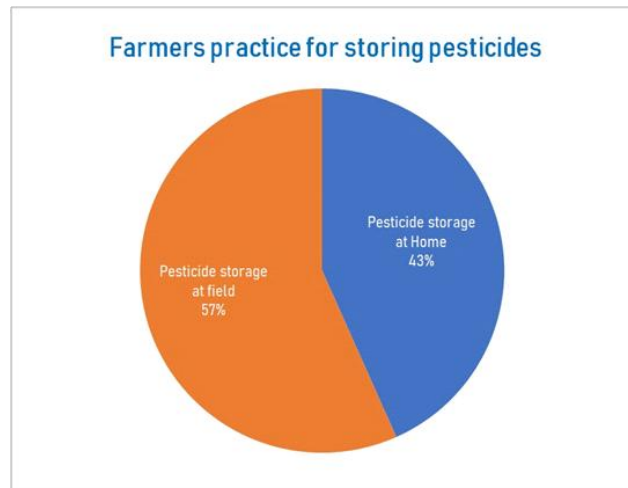


Fig 5. Farmers practice on storage of pesticides

Pesticide advisories

The majority of farmers (58%) choose pesticides to manage pests and diseases based on their own experience, (23%) contact pesticide dealers, while some seek advice from neighbor farmers (12%). Very few farmers (7%) prefer to meet with Agriculture officers for pesticide recommendations (Table 1 and Fig 6). The relation between contact of farmers for advisories and literacy levels reveals that there is no relation as the P value is more than 0.05. Meenambigai *et al.* (2017) also reported that only 10% of farmers in Tamil Nadu get information from government agriculture personnel's and 14.17% got

information from fellow farmers, Kumar *et al.* (2020) also concluded that 49% own experience and 22% are got information from dealers in West and East Godavari districts.

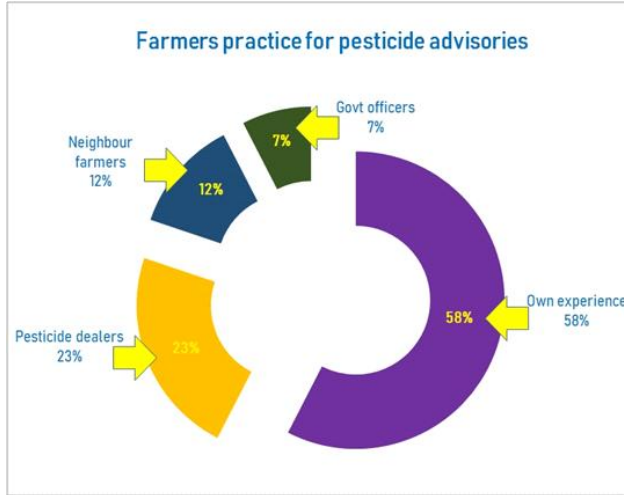


Fig 6. Farmers practice for taking advisories on use of pesticides

Disposal and Re-Use of pesticide containers

Majority of farmers (60%) are simply throwing empty pesticide bottles / containers in the field, generally in the corner of the fields, while 40% of them are throwing in canals / drainage / road (Table 1 and Fig 7). It was recorded that 37% of the farmers are re-using the empty containers, for house-hold purposes, and 63.00% farmers are not using the empty containers for any purposes (Table 1 and Fig 8). There is no relation between practice of pesticide disposal and education of the farmer. These results were in concurrence with the findings of Satya Sai *et al.* (2019) in Southern India concluded that empty containers are thrown in open field (59.06%) and threw in dustbin (12.87%). Yadav and Dutta (2019) also concluded that 72.8% are through them in the field and 15.2% of respondents are reuse the empty containers in Rajasthan.

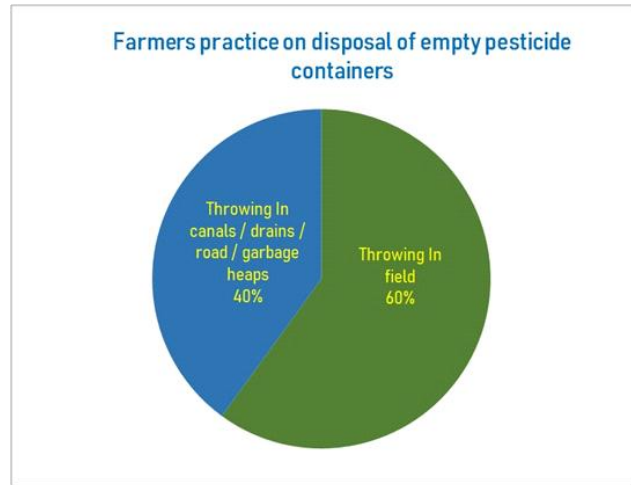


Fig 7. Farmers practice on disposal of empty containers

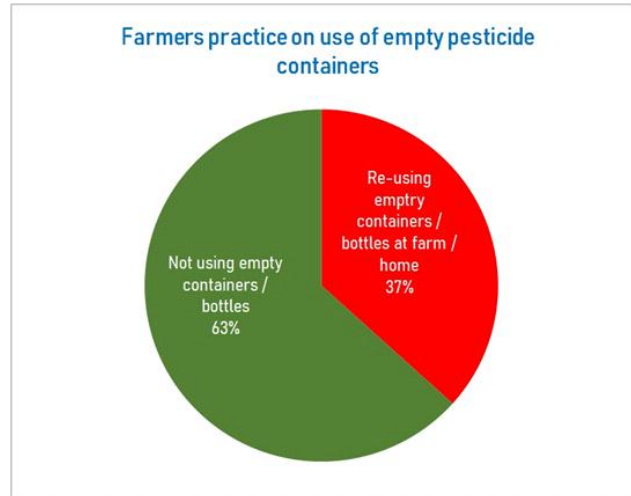


Fig 8. Farmers practice on re-use of empty containers Practices followed before, during and after spraying

It was recorded that the majority of farmers (54%) did not use any personal protection equipment (PPE) while spraying, where only (20%) wear the face and nose mask while 26% farmers wear full sleeve shirts during the spraying of pesticides (Table 2 and Fig 9). In finding that Sai *et al.* (2021) reported that none of the farmers are used goggles/ Eye wear for protection of eyes from pesticides, while only 6.67% wear face mask, only 16.67% used hand gloves and 20% are wearing full cover clothes in cucurbits area of Guntur district. The study also found that 47% of them have not taken food, alcohol or smoke during the spraying (Table 2 and Fig 10).

Table 1. General awareness / knowledge and practices followed by farmers on various aspects of pesticides.

S No.	Particulars	Response / practice followed	Percentage	P value
1	Awareness on recommended pesticide	Yes	63	0.16
		No	37	
2	Pesticide classification and toxicity symbols on packing	Yes	23	0.925
		No	77	
3	Measuring of pesticide	Bottle cap	63	0.838
		Approximately	27	
		Both	10	
4	Mixing of pesticides	Stick	54	0.332
		Bare hands	33	
		Both	13	
5	Storage of pesticides	Home	43	0.936
		Field	57	
6	Advisories / Source of information on pesticide recommendation	Own experience	58	0.853
		Pesticide dealers	23	
		Neighbour farmers	12	
		Govt officers	7	
7	Disposal of empty containers	In field	60	0.626
		In canals / drains / road / garbage heaps	40	
		Selling	0	
8	Re-use of empty containers	Yes	37	0.16
		No	63	

Table 2. Spray men practices before, during and after spraying pesticides

S No.	Particulars	Details	Percentage	P value
1	Usage of PPE during spraying	Wearing Mask	20	0.933
		Wearing full sleeves shirts	26	
		Not using any kind of PPE	54	
2	Other practices during the spraying	Eating food	10	0.246
		Smoking or chewing tobacco	23	
		Drinking (alcohol)	20	
		None	47	

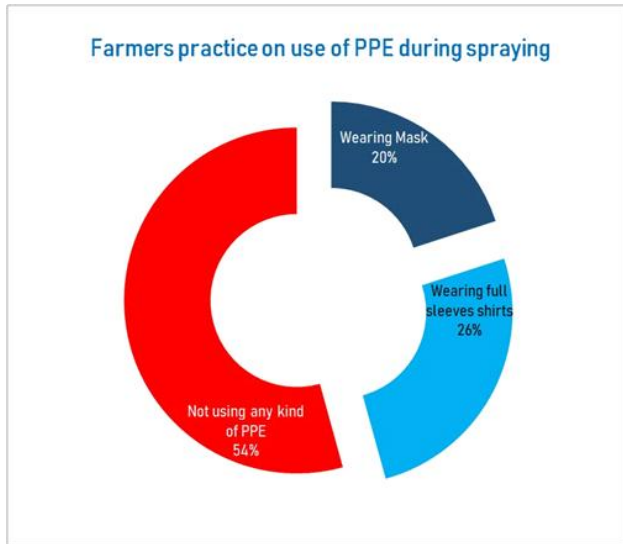


Fig 9. Farmers practice on use of PPE during spraying

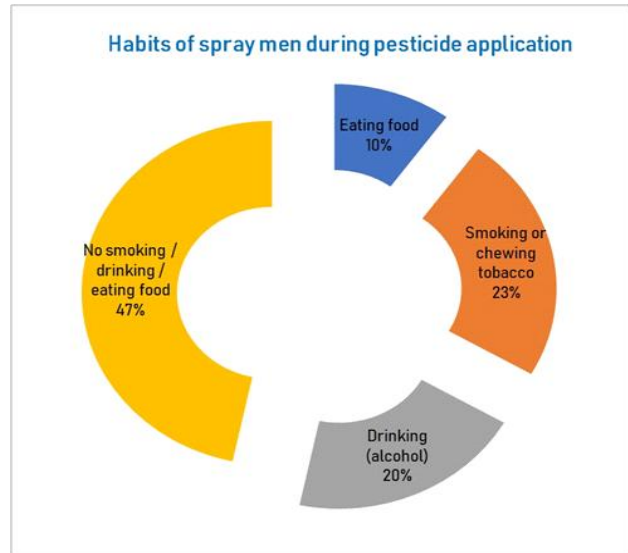


Fig. 10. Spray men habits during pesticide application

Awareness about symptoms of poisoning and first aid

It was found that majority of them said that skin irritation is the common symptoms experienced by spray men (34%), in addition to breathlessness (23%), eye irritation (17%), head ache (14%) and cough (Table 3 and Fig 11). To understand the awareness on first aid practices followed in case of poisoning / exposure to pesticides, interactive meeting was conducted, and it was noted that most common first aid followed is cleaning the affected area with

water (40%) or soap water (37%), and about 23% are aware about the inducing vomiting in case the person swallows the pesticides (Table 3 and Fig 12). Kumar *et al.* (2017) found that skin irritation 40%, breathlessness 20%, head ache 20%, eye irritation 13.33%, and cough 6.66% among spraymen. The major first aid techniques followed were washing the affected area with water followed by soap water. Same results are reported in Faridabad district by Tyagi *et al.* (2015) that common health problems are headache and dizziness (27%), 18% of skin problems are observed.

Table 3. Spray men experience on health ailments due to spraying and knowledge on first aid methods.

S No.	Particulars	Details	Percentage	P value
1	Common health ailments / issues observed during spraying	Cough	12	0.837
		Skin irritation	34	
		Breathlessness	23	
		Headache	14	
		Eye irritation	17	
2	First aid methods followed	Inducing vomiting if swallowed	23	0.947
		Cleaning the affected area with water	40	
		Cleaning the affected area with soap water	37	

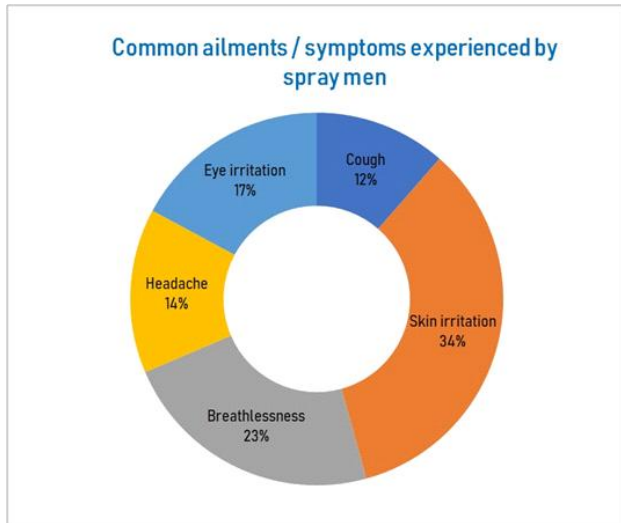


Fig. 11. Common ailments / symptoms experienced by spray men during / after pesticide application

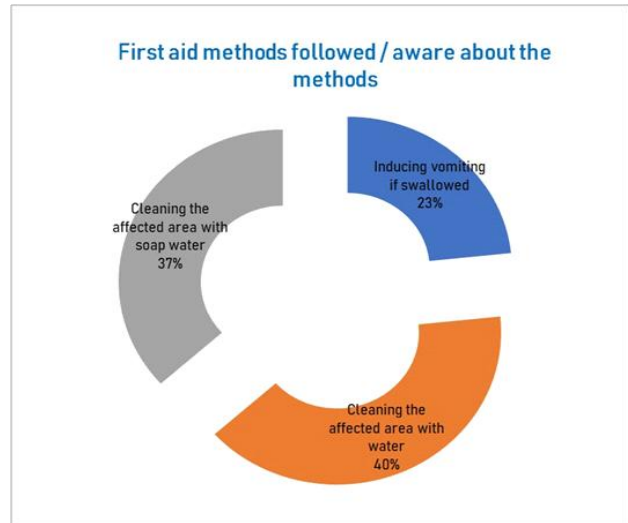


Fig. 12. First aid methods followed / awareness about first aid methods

Awareness on pesticide residues and pre harvesting interval

The study revealed that 12% of the farmers are aware about the pesticide residues in food commodities (Table 4 and Fig. 13). Very few of them (3%) are aware about the issue of agricultural produce rejections due to presence of pesticide residues, while majority of them (47%) have responded that they never heard about the produce rejections due to pesticide residues (Table 4 and Fig. 13). The results obtained were in accordance with Shashi *et al.* (2016) reported that 6.66% of the peoples are aware about pesticide residues

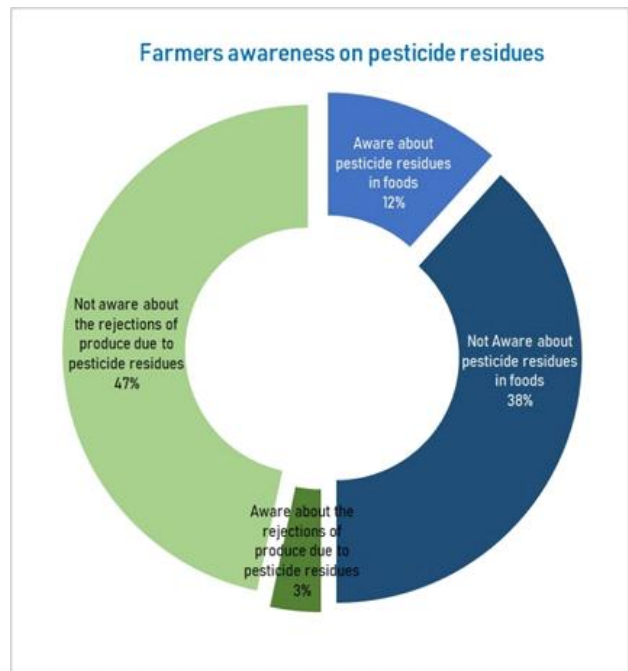


Fig 13. Farmers awareness on pesticide residues

Table 4. Awareness on pesticide residues and pre harvesting interval.

S No.	Particulars	Details	Percentage	P value
1	Awareness on pesticide residues	Aware	12	0.397
		Not Aware	38	
2	Awareness on export rejections due to pesticide residues	Aware	3	0.338
		Not Aware	47	

CONCLUSION

The present study concluded that majority of the farmers were not aware about pesticide classification, pesticide residues and their consequences in food stuffs, rejection of the food exports due to pesticide residues, disposal of the empty containers, using of the personal protective equipment. Majority of the farmers are aware of the recommended pesticides on maize and choose the pesticides based on their own experience.

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