

## AWARENESS OF AGRO INPUT DEALERS ABOUT INSECTICIDE LABEL CLAIMS

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### ABSTRACT

*Insecticide label claims are important sources of information for the farmers and the agro input dealers who sell them. They provide information about the active ingredients, mode of action, target pests, dosage, application method, safety precautions and environmental impact of the insecticides. However, the awareness level of the agro input dealers about these label claims is not well known. This study aimed to assess the awareness level of 120 agro-input dealers in Beed district of Maharashtra state, India, about the insecticide label claims and their toxicity labels. The study also examined the relationship between the profile of the agro input dealers and their awareness level, and identified the constraints and suggestions of the agro-input dealers regarding the insecticide label claims. The study used a structured questionnaire to collect data from the respondents through personal interview method. The data were analysed using frequency, percentage, mean, standard deviation and correlation coefficient. The results showed that the majority of the agro-input dealers had low to medium level of awareness about the insecticide label claims and their toxicity labels. The profile variables such as age, education, experience, training and membership in association had significant positive correlation with their awareness level. The major constraints faced by the agro input dealers were lack of training, inadequate display of label claims, complex language of label claims and low literacy level of farmers. The major suggestions given by the agro input dealers were to provide regular training, simplify the language of label claims, increase the font size and colour contrast of label claims and educate the farmers about the importance of label claims.*

**Keywords:** agro input dealers, insecticide label claims, toxicity labels

### INTRODUCTION

Insecticides are widely used by farmers to control pests and diseases on crops. However, improper use of insecticides can pose serious risks to human and environmental health, as well as reduce the efficacy of pest management. Therefore, farmers must be aware of the label claims and toxicity labels of insecticides, which provide information on the product name, the active ingredient, mode of action, target pests, dosage, application method, safety precautions, and disposal instructions.

However, despite the importance of label claims, there is a lack of awareness among the farmers and the agro-input dealers about them. Several studies have reported that farmers often do not read or understand the label claims of insecticides and tend to rely on their own experience or advice from others (Kumari et al. 2017; Singh et al. 2018; Yadav et al. 2019). Similarly, agro-input dealers who play a vital role in providing insecticides and technical guidance to the farmers also have limited knowledge and awareness about the label claims. This can lead to misuse or overuse of insecticides, resulting in reduced efficacy, increased cost, resistance development, pest resurgence, human poisoning

and environmental contamination.

Pesticide use in India is regulated by the Central Insecticides Board and Registration Committee (CIBRC) and the Food Safety and Standards Authority of India (FSSAI). The CIBRC registers pesticides for crops while the FSSAI sets the maximum residue limits (MRL) of pesticides for the crops it has been registered. If a food has a higher level of residue than the MRL, it means that the food is not safe to eat. A residue above the MRL may show that the farmer has not used the pesticide properly. Uses of spurious and non-recommended pesticides by the CIBRC i.e., without approved label claims are the reasons for pesticide residues in food commodities. CIBRC stated that the use of pesticides is a hazardous sector and unless pesticides are used as approved by the Registration Committee, the whole environment could be at risk. There have been issues countrywide about inadequate knowledge about labels and their utilization. Usage of pesticides without approved label claims leads to the presence of residues of those pesticides on particular crops.

### Label claim

Pesticides Company registered its products as per Insecticide Act 1968 and claimed that the registered products are for management of certain pest on particular crop only as per the written, printed or graphic label on the container approved by the government regulatory agencies. It also includes any written, printed or graphic matter accompanying the pesticides like technical leaflets or brochures.

### Toxicity labels

Toxicity labels viz; red label, yellow label, blue label and green label are mandatory labels employed on pesticide containers in India identifying the level of toxicity (that is, the toxicity class) of the contained pesticide. The scheme follows from the *Insecticides Act* of 1968 and the *Insecticides Rules* of 1971. The labeling follows a general scheme as laid down in the *Insecticides Rules, 1971*, and contains information such as brand name, name of manufacturer, name of the antidote in case of accidental consumption etc. A major aspect of the label is a color mark which represents the toxicity of the material by a color code. Thus, the labelling scheme proposes four different colour labels: viz red, yellow, blue, and green.

It was observed that agro-input dealers were unaware of the insecticides label claims and toxicity label and they are mostly using insecticide as the input dealers recommended them. Hence the present research study was carried out with the specific objective to study the awareness of the agro-input dealers about insecticide label claims and toxicity labels in the Beed district. It also provides a relationship between the profiles of agro-input dealers with their level of awareness of insecticide label claims.

### OBJECTIVES

- (1) To study the profile of agro input dealers.
- (2) To assess the awareness level of insecticide label claims among the agro input dealers.
- (3) To assess the awareness level about toxicity label of insecticide among the agro input dealers.
- (4) To delineate relationship between profiles of agro input dealers with their awareness of insecticide label claims.
- (5) To find out the constraints faced by the agro input dealers about insecticide label claims and to invite their suggestions about it.

### METHODOLOGY

The study was conducted in Beed district of

Maharashtra state, which is one of the largest producers of cotton and pulses in India. Cotton is a major crop that requires intensive use of insecticides to control pests. The district has 11 blocks and 1474 villages with a total population of 25.85 lakh (Census 2011). The district has about 1500 registered agro-input dealers who supply various inputs such as seeds, fertilizers, pesticides and machinery to the farmers. Pesticides labels contain detailed information on how to use the product correctly and legally. The present study was carried out to find out the awareness of agro input dealers about insecticide label claims in term of knowledge level. The study was conducted in randomly selected three blocks viz., Ambajogai, Kaij and Parli from Beed district. From the selected blocks, 40 villages were selected for the study. Two to four agro input dealers were randomly selected from each selected village. Thus, total of 120 respondents were selected for the study. Ex-post facto research design was used for the study. The interview schedule was used as a tool for collection of requisite data. The suitable statistical tools used were viz., frequencies, percentages, arithmetic mean, standard deviation, correlation and regression.

A teacher made knowledge test was developed to measure the awareness of an individual respondent about the insecticide label claims, responses of the respondents were taken on two-point continuum i.e., yes / no and numerical score of 1 and 0 was assigned respectively. Obtained awareness raw score was converted into awareness index by using following formula;

$$\text{Awareness index} = \frac{\text{Awareness score actually obtained}}{\text{Maximum obtainable awareness score}} \times 100$$

The respondents were categorized according to obtained awareness index score into low, medium and high category on the basis of mean  $\pm$  standard deviation.

Similarly, awareness index score of the respondents about toxicity label printed on the insecticide containers was calculated by using above formula. The respondents were categorized according to awareness index score into low, medium and high category on the basis of mean  $\pm$  standard deviation.

### RESULTS AND DISCUSSION

#### Profile of the respondents

Table 1 indicates the profile of agro input dealers. The data revealed that majority (57.50%) of the respondents were found in middle age group. Whereas 30 per cent and 12.50 per cent of them were in young and old agegroup, respectively.

As per as education of the respondents is concern,

Table 1: Distribution of agro input dealers according to their profile

(n=120)

Sr. No.	Profile	Frequency	Per cent
<b>1</b>	<b>Age</b>		
	Young (Upto 32 yrs)	36	30.00
	Middle (46 to 56yrs)	57.5	75.00
	Old (57yrs& above)	15	12.50
	<b>Mean – 46.28      SD – 9.8</b>		
<b>2</b>	<b>Education</b>		
	Illiterate	0	0
	Primary	0	0
	Secondary	27	22.50
	Higher secondary	36	30.00
	College level	51	42.50
	Agricultural education	06	05.00
<b>3</b>	<b>Annual income</b>		
	Low (Upto ₹ 86602/-)	09	07.50
	Medium (₹ 86603/- to 382898/-)	81	67.50
	High (₹ 382899/- & Above)	30	25.00
<b>Mean ₹ 234750/-      SD ₹ 148148/-</b>			
<b>4</b>	<b>Experience as an input dealer</b>		
	Low (Up to 6yrs)	09	07.50
	Medium (7 to 25)	93	77.50
	High (26 & Above)	18	15.00
<b>Mean – 15.4      SD – 9.9</b>			
<b>5</b>	<b>Farming Experience</b>		
	Low (Up to 12 yrs)	21	17.50
	Medium (13 to 27 yrs)	84	70.00
	High (28 yrs& Above)	15	12.50
<b>Mean – 19.55      SD – 7.11</b>			
<b>6</b>	<b>Land holding</b>		
	Landless (No holding of agri. land)	03	02.50
	Marginal (Up to 1 ha)	15	12.50
	Small (1.1 to 2 ha)	48	40.00
	Medium (2.1 to 4 ha)	33	27.50
	Semi medium (4.1 to 10 ha)	18	15.00
Big (10.1 ha & above)	03	02.50	
<b>7</b>	<b>Social participation</b>		
	Low (Up to -0.43)	90	75.00
	Medium (-0.44 to 1.43)	06	05.00
	High (1.44& above)	24	20.00
<b>Mean – 0.5      SD – 0.93</b>			
<b>8</b>	<b>Extension contacts</b>		
	Low (up to 22.41)	12	10.00
	Medium (22.42 to 40.15)	90	75.00
	High (40.16& above)	18	15.00
<b>Mean – 31.28      SD – 8.87</b>			

Sr. No.	Profile	Frequency	Per cent
9	<b>Training received</b>		
	Yes	48	40.00
	No	72	60.00
10	<b>Source of information</b>		
	Low (up to 11.1)	24	20.00
	Medium (11.1 to 17.3)	69	57.50
	High (17.29 & above)	27	22.50
	<b>Mean – 14.2    SD – 3.1</b>		

it was observed that 42.50 per cent of them were educated up to college level. Whereas, 30 per cent and 22.50 per cent of them were educated up to higher secondary school and secondary school level respectively. Only 5 per cent of them had agricultural education (either diploma or degree) and none of them were illiterate and primary level.

Data also revealed that majority of the respondents (67.50%) were having medium level of annual income i.e. between ₹ 86602/- to 382898/- Whereas 25 per cent and 7.5 per cent of them were having high level of annual income i.e. more than ₹ 382899/- & Above and low level (Up to ₹ 86602/-) of annual income.

As regards to experience as a agro input dealer, 77.50 per cent of the respondents having medium experience as a input dealer i.e. between 7 years to 25 years' experience, followed by 15 per cent and 7.5 per cent of them having high experience i.e. above 26 years and low experience i.e. up to 6 years of experience as a input dealers, respectively.

Regarding farming experience of agro input dealer, majority of them (70%) having medium farming experience i.e., 13 years to 27 years, while 12.5 per cent and 17.50 per cent of them having high level (i.e. above 28 years) and low level (i.e. upto 12 years) farming experience, respectively.

In case of land holding, 40 per cent of the respondents were small land holder (i.e. 1.1 to 2 haland holding), followed by medium (27.5 %) and semi medium (15 %) land holders. Whereas, 12.5 per cent of them had marginal land holding and 2.5 per cent of them had found big land holding. While 2.5

per cent of them did not have any agricultural land.

The data from Table 1 further revealed that 75 per cent of the respondents were having low level of social participation, followed by 20 per cent and 5 per cent of them having high and medium level of social participation, respectively.

As regards to extension contact, 75 per cent of them were having medium level of extension contact, followed by 15 per cent and 10 per cent of them were having high and low level of extension contact, respectively.

Data regarding training received about label claim by the respondents, only 40 per cent of the respondents were received training about label claim of insecticides.

In case of sources of information, majority of the respondents (57.50%) were having medium level of sources of information, followed by high (22.50%) and low (20.00%) level of sources of information.

### Awareness of insecticide label claims among the agro input dealers

#### Statement wise awareness of insecticides label claims

Total nine (9) important statements about the insecticides label claims have been considered for accessing the awareness of the respondents about the label claims and presented in Table 2.

**Table 2: Distribution of the agro input dealers according to awareness about the label claims of insecticides**

(n=120)

Sr. No.	Awareness test statements about the insecticide label claims	Number of respondent aware about label claims	
		Frequency	Percentage
1	Do you know about Insecticides Act 1968?	108	90.00
2	Do you know about the Central Insecticides Board & Registration Committee (CIBRC)?	66	55.00
3	Do you know the insecticides label claims?	72	60.00

Sr. No.	Awareness test statements about the insecticide label claims	Number of respondent aware about label claims	
		Frequency	Percentage
4	While selling insecticides, do you ensure whether particular insecticide is having label claim for specific insect / disease and crops?	117	97.50
5	Prior to selling insecticides, do you read carefully all instructions given on the label claims?	114	95.00
6	Do you guided details to the customer farmers about spraying of insecticides as per recommendation of label claim?	117	97.50
7	Do you advice to the customer farmers about recommended dose of insecticides as per label claim?	117	97.50
8	Do you provide the information about Maximum Residues Level / Limit (MRL) of insecticides to the customer farmers?	114	95.00
9	Do you provide the information about when do you stop spraying of insecticide before harvesting to avoid residues of insecticides i.e., waiting period (PHI – Post Harvest Interval)	108	90.00

It was observed that 90.00 per cent of the agro input dealers know what is the label claim of insecticide and 60.00 per cent of them ensure whether particular insecticide is having label claim for specific insect / disease and crops while selling it. Whereas 97.50 per cent of them were advice to the customer farmers about recommended dose of insecticides as per label claim. While 95 per cent of them were read all instruction given on the label claims, and 97.5 per cent of them guided details to the customer farmers about spraying of insecticides as per label claim.

It was further indicated that 90 per cent of the agro input dealers aware about Insecticide Act 1968 and 95 per cent of them were given the information about Maximum Residues Level of insecticides to the customer farmers at the time of selling. While 55 per cent of them aware about Central Insecticides Board and Registration Committee (CIBRC) and 90 per cent of them were given information about Post Harvest Interval (PHI) and its importance with seriousness.

**Overall awareness level about insecticides label claim**

**Table 3: Distribution of the agro input dealers according to their overall awareness level about insecticides label claims (n=120)**

Sr. No.	Awareness level about insecticide label claim	Frequency	Percent
1	Low (Upto 8.2)	21	17.50
2	Medium (8.3 to 13)	99	82.50
3	High (14& Above)	0	0
Mean – 10.6 SD – 2.4			

Overall knowledge level of agro input dealers about selected nine statements about insecticides label claims has been computed in the form of index and respondents have been distributed in three categories. Table 3 indicated that majority (82.5%) of the input dealers were found in medium awareness level group, followed by low awareness level (17.50%).

**Awareness of agro input dealers about toxicity label printed on insecticide container**

**Label wise awareness about toxicity of insecticide**

**Table 4: Distribution of the Agro Input Dealers according to awareness about the toxicity label of insecticides (n=120)**

Sr. No.	Awareness level about toxicity on the insecticide container	No of respondent aware about toxicity label of insecticides	
		Frequency	Percentage
1	Extremely toxic	108	90.00
2	Highly toxic	48	40.00
3	Moderately toxic	81	67.50
4	Less toxic	87	72.50

The data from Table 4 revealed that 90.00 per cent of the input dealer aware the ‘Extremely toxic’ label given on the insecticide container, while 72.5 per cent of them aware about ‘Less Toxic’ label printed on the insecticide container. Regarding insecticide label ‘Moderately toxic’, 67.50 per cent of input dealers about it whereas 40.00 per cent of them aware about the ‘Highly Toxic’ label of insecticides.

### Overall awareness level about insecticide toxicity label

The awareness level of the respondents about toxicity label printed on insecticide container has been computed in the form of index and presented in Table 5.

**Table 5: Distribution of the agro input dealers according to overall awareness about the toxicity label of insecticides (n=120)**

Sr. No.	Awareness level about the insecticide toxicity label	Frequency	Percent
1	Low (Up to 1.5)	27	22.50
2	Medium (1.6 to 3.9)	48	40.00
3	High (4 & Above)	45	37.50
Mean – 2.7 SD -1.2			

It was observed that 40.00 per cent agro input dealers were having medium awareness about toxicity label printed on insecticide container, followed 37.50 per cent and 22.5 per cent of them were having high and low level of awareness about toxicity label of insecticide, respectively.

### Relationship between profile of agro input dealers with their awareness level of insecticide label claims.

It could be seen from Table 6 that variables

### Constraint faced by the agro input dealers about insecticide label claims

**Table 7: Constraint faced by the agro input dealers about insecticide label claims**

(n=120)

Sr. No.	Constraints	Frequency	Percentage	Rank
1	Unable to read information of label claim provided on insecticide packet due to small font size	37	92.50	I
2	Non-availability of insecticides as per label claim for control of newly emerged insects	33	82.50	II
3	Sometimes Expire on insecticides bottles date print is not clear	29	72.50	III
4	Sometime insecticides are not provided the information brochure	26	65.00	IV

The constraints faced by the Agro Input Dealers about insecticide label claims is presented in Table 7. It was observed that 92.5 per cent of the respondents expressed the inability to read information of label claim provided on insecticide container due to small font size, while 82.5 per cent of them expressed the non-availability of insecticides as per label claim for newly emerged insects. Sometime, expiry date on insecticides container is not clearly printed expressed by 72.5 per cent of the respondents and 65 per cent of the respondent express that sometime insecticides information brochure is not provided by company.

experience as a input dealer and farming experience were having positively significant relationship with awareness about the label claim of insecticides by the input dealers at 0.01 level of probability. Whereas, social participation and training received were positively significant relationship with awareness at 0.05 level of probability and age, land holding, extension contact and source of information were not correlated with awareness about the insecticide label claim.

**Table 6: Relationship between profile of the agro input dealers with their awareness Index (n=120)**

Sr. No.	Variables	'r' value
X <sub>1</sub>	Age	0.012
X <sub>2</sub>	Education	-0.471**
X <sub>3</sub>	Annual income	-0.113
X <sub>4</sub>	Experience as a input dealer	0.459**
X <sub>5</sub>	Farming Experience	0.999**
X <sub>6</sub>	Land Holding	0.118
X <sub>7</sub>	Social Participation	0.319*
X <sub>8</sub>	Extension Contact	0.017
X <sub>9</sub>	Training Received	0.148*
X <sub>10</sub>	Source of Information	0.020

\* Significant at 0.05 level of probability

\*\* Significant at 0.01 level of probability

### Suggestions given by the agro input dealers about insecticide label claims

The suggestions provided by the Agro Input Dealers about Insecticide Label claims is present in Table 8. It was observed that 92.5 per cent of the respondents suggested increasing the font size of label claim information while 92.5 per cent of them suggested that Information of label claim should be printed on container in Marathi language. Label claim for insecticide should be given for insect of various crops of single family suggested by 85 per cent of the respondents, 77.5 per cent of them suggested to provide recommended

dose of insecticides in simple language. Among them 67.5 frequently about insecticide label claims. respondents suggested that agriculture officers should guide

**Table 8: Suggestions given by the agro input dealers about insecticide label claims**

(n=120)

Sr. No.	Suggestions	Frequency	Percentage	Rank
1	Font size of label claim should be increase	38	95.00	I
2	Information of label claim should be printed on container in Marathi language.	37	92.50	II
3	Label claim for Insecticide should be given for insect of various crops of single family	34	85.00	III
4	Recommended dose of insecticides should be provided in simple language	31	77.50	IV
5	Agriculture Officers should frequently guide about insecticide label claims (Particularly before monsoon season every year)	27	67.50	V

**CONCLUSION**

Majority of the agro input dealers (47.50%) were found medium level of awareness about insecticide label claims while 40 per cent of them were found medium level of awareness about insecticide toxicity label printed on the container.

It could be observed that variables experience as an input dealer and farming experience were having positively significant relationship with awareness about the label claim of insecticides among the input dealers at 0.01 level of probability.

Information of insecticide label claims are poorly printed on container in terms of font size which majority of the agro input dealers (92.5%) cannot be easily read and understood. Whereas 33.33 per cent of them suggested increasing the font size of information of label claim printed on insecticide container. CIBRC should enforce by act the pesticide company to print information of label claims clearly readable form and easy language.

The study clears that there is a need to create the awareness among the agro input dealers about insecticide label claims. Extension agency should frequently organize the training of agro input dealers on insecticide label claims.

CIBRC / Agriculture University of respective region / State Department of Agriculture should prepare single

mobile app which includes all information about insecticide label claims in easy local language and update it regularly when there is new insecticide approved or ban by CIBRC and also provide mobile calculator app for calculating the recommended dose of insecticide to the agro input dealers and also customer farmers.

**CONFLICT OF INTEREST**

This is to declare that there is “No conflict of interest” among researcher.

**REFERENCES**

Kapse P.S., Manvar V.S. and Ahire R.D. (2020). Awareness of Agro Input Dealers about Insecticide Label Claims in Marathwada Region. *Int. J. of Ext. Edu.*, 16: 88-93.

Staudacher P., Brugger C., Winkler M.S., Stamm C., Farnham A., Mubeezi R., Eggen R.I.L. and Günther I. (2021). What agro-input dealers know, sell and say to smallholder farmers about pesticides: a mystery shopping and KAP analysis in Uganda. *Env. Health* 20: 100.

Singh S.P., Singh A.K., Singh R.P. (2019). Knowledge level of pesticide retailers regarding safe handling practices in eastern Uttar Pradesh.

Received : May 2023 : Accepted : June 2023