

farmers' pest management and rationalizing pesticide use (Escalada *et al.*, 2009).

IPM advocates strongly believed that overuse of chemical pesticides can seriously damage the ecosystem and the environment (Mangan and Mangan, 1998). They also noted that natural pest control in farming has also reduced due to a reliance on chemical control. Pesticides often bring pest outbreaks by killing beneficial insects (FAO, 2000). Moreover, the excessive use of pesticide can generate new pest species which are highly resistant and invulnerable to pesticides (Mangan and Mangan, 1998).

The overuse of insecticides in rice described as “pesticide tsunami” by Cheng and Heong (2010) has altered farmers' sustainable practices in farming. Pesticide companies operate in the rural areas, making pesticides readily available to farmers. Remote areas which can hardly be visited by extension agents rely on pesticide “kiosks” operated by different pesticide companies. Most of these kiosks become default pest control advisers (Cheng and Heong, 2010).

IPM initiatives have used the mass media to improve farmers' pest management decisions in pesticide use. Print materials, such as pamphlets and posters, billboards, and radio and TV programs were specifically designed to motivate farmers to reduce unnecessary insecticide use (Escalada, Heong, Huan and Mai, 1999).

Aggressive advertising and marketing campaigns launched by the pesticide industry have made a significant impact on pesticide use (Cheng and Heong, 2010). Kincheloe and Horn's study (2006) noted that modern-day advertising generally uses conditioning to create associations between products and consumer needs. Knowing that these kinds of connection are usually temporary, companies follow Pavlov's ideas of repetition and continually advertise to keep these associations in farmers' minds (Escalada *et al.*, 2009).

Farmers usually get pesticide information from different sources. In China, farmers learned about pesticide use from government technicians, pesticide sales people, pesticide labels, and other farmers (Li, Guo, Hu, and Liang, 1997). Moreover, Diaz (2002) noted that farmers in the Philippines just rely on their field experience and follow the trial and error method in using agrochemical inputs. Mass media ads in radio, television, and print are also some of the information sources of pesticide information among rice farmers in Thailand (Upanisakorn, 1997).

Lichtenberg and Zimmerman (1999) indicated that farmers regard first-hand sources of information such as direct field observation and pesticide labels as being the most important. Thus, processing of information on pesticide advertising needs to be systematically assessed.

RESEARCH METHODS

Research Design, Setting and Respondents

The study followed the one-shot survey research design. Farmers were selected through random sampling in each study site. Only barangays in large rice-growing areas, as identified by agricultural technicians during an informal interview, were selected. Moreover, these sites were also accessible to the researcher. A slight modification was made of the sample sizes in each barangay

due to the unavailability of respondents at the time of the interview (see Table 1). This study was conducted in rice growing areas in Leyte particularly in Albuera, Hilongos, Baybay, and Ormoc City.

Table 1. Distribution of respondents in study areas.

Municipality	Barangay	Sample Size
Ormoc	Licama	20
Albuera	Planas	30
Baybay	Hibunawan	30
Hilongos	Concepcion	20
Total		100

Selection of the Stimulus Materials

Stimulus materials. In Leyte, more than 20 pesticide posters are usually displayed in the community. Six samples of rice insecticide posters distributed and displayed inside and outside the agrochemical supply stores were selected by the pesticide sales technicians. These were posters on *Applaud* (buprofezin), *Lorsban* (chlorpyrifos), *Legend* (esfenvalerate), *Chix* (betacypermetrin), *Nurelle* (chlorpyrifos), and *Anvil* (sumithrin) which were shown to the respondents in an arranged exposure. Farmers were gathered in a barangay hall and were requested to examine the pesticide posters which were presented at random manner to control primacy and recency effects. Each poster was presented for three minutes. After viewing each poster, respondents were interviewed to gather data on the dependent variable measures.

Data Gathering Tools and Procedure

Individual interviews. Farmers were gathered in a barangay hall to collect their background information through a questionnaire. With the help of senior year development communication students who were trained in interviewing, respondents were asked first about their background characteristics and pest management practices. Next, respondents were exposed to the first poster for three minutes. After the exposure, respondents were asked about their interpretation of the poster. The same procedure was followed until the last poster was viewed. The poster number corresponds to these insecticide products: 1 - Applaud, 2 - Lorsban, 3 - Legend, 4 - Chix, 5 - Nurelle, and 6 - Anvil.

Focus group discussion. Participants in the FGD consisted of 10 farmers. Questions dealing with respondents' perceptions and reactions to pesticide information in the insecticide posters were raised in the discussion.

RESULTS AND DISCUSSION

Respondent Profile

Of the 100 farmers interviewed, 59% were men and 41% were women (Fig. 2). Almost half of the respondents (35%) fell in the 46-60 age bracket, followed by 32 percent who belonged to the 22-45 years old age group. More than one-fourth (28%) were 61-76 years old and the remaining five percent were in the 21 years old

age group. In terms of education, 50% attended elementary level of education and 26% had reached high school level. Some 11 % reached the college level and 13% had no schooling at all. Most had spent their lives as rice farmers, with farming experience ranging from 5-60 years and averaging 25 years. Farmers had an average rice yield of 2 t ha^{-1} .

Interpretation of Posters

To examine respondents' interpretation of the posters, Bertrand's (1978) measures of effectiveness were applied, namely, attractiveness, comprehensibility, acceptability and self-involvement.

Attention. To gauge the attention of the respondents to each poster, they were asked which part grabbed their attention the most and why. Figure 1, which summarizes the responses across the six posters, shows that packaging or the insecticide bottle and images used in the label drew the attention of two-thirds of the respondents (67%). Respondents specified that images of strength, i.e., boxing gloves, Superman, and the peso sign, were attractive. Slogan (43%), poster text (36%), and brand name (13%) were other elements specified by respondents. When respondents were asked why the poster grabbed their attention, most of them indicated that the poster used words that were catchy or pleasant to hear or they found it to be pleasing, realistic, and attractive.

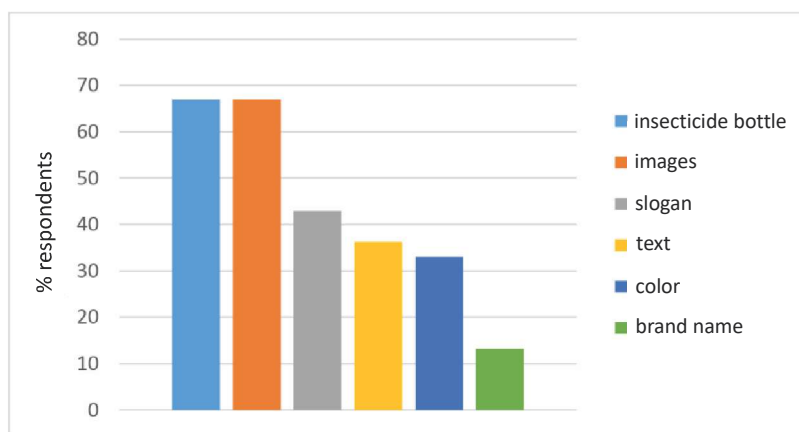


Fig. 1. Poster elements which grabbed respondents' attention.

Comprehensibility. Comprehensibility refers to the extent to which the respondents understood the content of the posters. Respondents were also asked for the message of the poster, the slogan, and the text. Their responses to these three questions were then scored if correct, incorrect, or don't know. The sum of correct scores for each poster was then aggregated into three levels: low (0-6 points), moderate (7-13 points), and high (14-20 points). Figure 2 reveals that the majority of respondents gave the correct message of the poster and their correct answers fell in the high category.

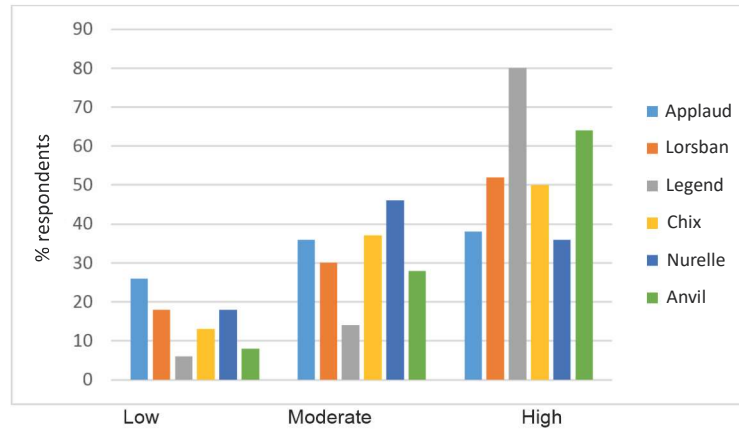


Fig 2. Perceived comprehensibility of posters.

Acceptability. Respondents were asked if there was something in the poster that they found to be offensive (Fig. 3) and they did not believe to be true (Fig. 4). Results show that the big majority of the respondents did not find anything offensive in the posters nor did they find content that they did not regard to be true. The small percentage of respondents who found something offensive mentioned the words, “caution”, “150%”, and “super triple”. Poster images considered not to be true were: Superman, boxer's arm, dense rice hills, quality rice and sword, and the letter X, and slogans such as “Super at grinding hoppers” and “Wipe out hoppers and borers”.

Self-involvement. Across the six posters, exactly four-fifths of the respondents thought that farmers like them were the intended audience of the posters while about 10% each of the respondents expressed that these were meant for hired spray laborers or the general public (Table 2). The reasons given by respondents for thinking that the poster was either meant for them or for hired sprayers are presented in Table 2.

Table 2. Self-involvement of posters.

Self-involvement	Posters					
	1	2	3	4	5	6
<i>Intended audience</i>						
Farmers	91.0	71.0	86.0	77.0	74.0	82.0
Sprayers	7.0	11.0	9.0	17.0	5.0	11.0
General public	2.0	18.0	5.0	6.0	21.0	7.0
<i>Reasons for intended audience</i>						
Farmers use pesticide	76.0	76.0	44.0	75.0	59.0	42.0
The information is relevant to them	22.0	14.0	17.0	19.0	41.0	33.0
It was shown by pesticide agents	2.0	3.0	4.0	2.0	0.0	2.0
Rice images in poster	0.0	0.0	30.0	4.0	0.0	23.0
Don't know	0.0	7.0	5.0	0.0	0.0	0.0

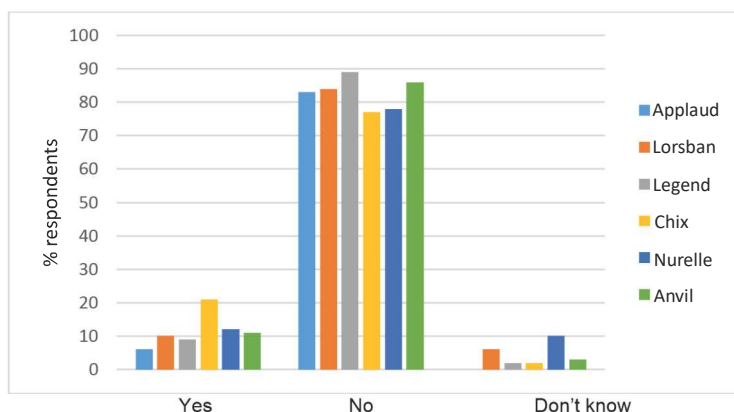


Fig. 3. Distribution of respondents who found something offensive in posters.

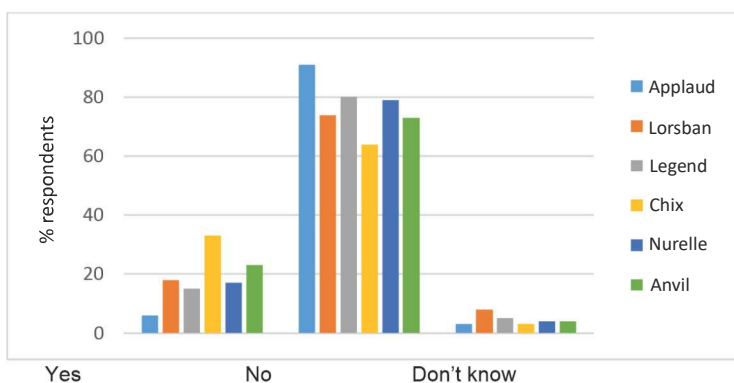


Fig. 4. Distribution of respondents who found something in posters they did not believe to be true.

Focus Group Discussion

The focus group discussion results seemed to reflect the findings of individual interviews. Most of the FGD participants expressed that they found the posters attractive and that the posters would help solve their pest problems, help them choose good chemicals, and kill insects in the fields. Some participants admitted that posters encouraged them to buy pesticides. Others were even thankful for the poster because it reminded them about what pesticide to use for specific pests. Respondents also agreed with the slogans used in the posters as they thought that the product claims were already tested and proven by professionals which could help them choose the appropriate chemical to control a specific pest.

IMPLICATIONS AND RECOMMENDATIONS

This study focused on understanding farmers' interpretation of insecticide posters. Focus group discussion results indicated that farmers had knowledge gaps and misconceptions of the posters' message. Farmers thought that the posters encouraged them to use pesticide excessively when that recommendation was not in the posters. It appears that pesticide use has been well entrenched in the minds of farmers that a poster is perceived to be associated with insecticide use.

In promoting a pesticide and entice farmers to buy it, the results clearly showed that companies can focus on branding, visual images, and text size of outdoor print advertisements such as the poster. These elements in the posters were most attractive to farmers. Moreover, realistic images in the posters can help the audience relate and understand and have confidence to buy the product. The use of animated images in the poster on the other hand, seemed to have negative influence. Text size could also be considered as most of the respondents who belonged to the old age bracket and had visual acuity problems, had difficulty recognizing the small font size used.

The study clearly showed that farmers could easily be influenced to buy and apply pesticides. The main message the posters had to most farmers was reminding them to apply the pesticides. These promotional devices had direct influence on promoting applications but not necessarily appropriate and profitable use of pesticides for pest management. In fact in most cases Asian farmers' insecticide applications have questionable productivity gains (Heong, *et al.*, 2015a). It is now well established that inappropriate use (or misuse) of insecticides tends to induce the development of secondary pests, the brown planthopper, that had become a major threat to rice production in Asia (Heong, *et al.*, 2015). Pesticide misuse, not only can induce pest outbreaks, but it is also a threat to the environment and human health (Heong *et al.*, 2015b). Sublethal doses of certain insecticides are now known to cause bee colony collapse (Raine and Gill, 2015) and neurological diseases, such as Parkinson's and Alzheimer's diseases in humans (Casida *et al.*, 2013).

Suggestions for Further Research

A future study to systematically assess the credibility of insecticide posters and its influence on pest management decisions of farmers is suggested. In this study the credibility factors of expertise, trustworthiness, and attractiveness need to be explored. Another relevant study evaluating pesticide posters should be done to probe other possible reasons why some farmers misuse pesticides. A content analysis of popular pesticide posters can likewise be undertaken to examine the selling points and emotional appeals used which might create fear associated with misuses and interviews with farmers can be conducted to determine if the appeals used resonate with the intended audience. Results of this study can help IPM and green agriculture advocates to counteract excessive and unnecessary pesticide use.

In development communication studies that include pest management practice as one of the independent variables, the number of pesticide applications, disaggregated by type of pesticide, should be included since this is the gold standard in measuring pest management practice.

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