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Assessment of Corn Farmer's Knowledge and Awareness Level of Integrated Pest Management (IPM) in Alfonso Lista Ifugao, Philippines

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Abstract: ***A survey study was carried out to assess the knowledge and awareness level in Integrated Pest Management (IPM) technology and concepts among corn farmers in Alfonso Lista in the Province of Ifugao Philippines. Fifteen barangays constituting the major corn planting areas of the municipality were chosen. The sample size was 400 respondents. The results indicated that 67% of the respondents are between the ages of 31-50 years old with 69% as male and 31% female. Less than half of the respondent (28%) have high school graduate diploma while 6% are college graduates. The findings of the study indicated that the respondents have low levels of knowledge and awareness in integrated pest management technology and concepts hence they relies more on chemicals in combating insect and weeds infestations. The findings of study showed that the respondent have also low levels in terms of training and access to information and publications regarding IPM. The correlation and regression analyses indicated that age and knowledge/awareness level are negatively correlated. This indicates that the respondents who are 31-50 years ofage lack trainings which played a major role in their low levels of IPM knowledge and awareness.***

Keywords: IPM**,** Knowledge, Awareness, Training, Information, Education, Age

1. Introduction

Integrated Pest Management (IPM) is a technology that utilizes all suitable pest management techniques and methods to keep pest populations below economically injurious levels. IPM has a comparative advantage of minimizing the excessive use of pesticides in crop production and management. Subsequently, it has been referred to as an important component for sustainable agriculture. Sustainable agriculture and IPM objectives both aim for an ecological balanced understanding of the environment (Morse et. al, 2000). Effects of excessive use of pesticides in agricultural productions are wide spread in the environment and as such, urgent solution is required for an immediate mitigation. IPM is an effective alternative pest control management that uses such methods as biological, physical, as well as minimal application of chemical to control pest infestation. Advantages of IPM methods in crop production includes; increased yield, decrease in farm inputs, less use of pesticides and reduction in the negative imparts that results to environmental degradation (Erbaugh et al., 2001).

The need to extend IPM technology to rural farmers is of a paramount importance for full realization of its potentials to agriculture and to human development. Kyamanywa (2001) reported that information's on the implementation methods of IPM are yet to reach rural farmers engaged in different agricultural production. In another study, Afreh-Nuamah, (2001) reported that awareness of IPM methods is a crucial step in IPM implementation.

The municipality of AfonsoLista is predominantly an agricultural district of the province of Ifugao Philippines with a total land area of 41,051 hectares of rolling terrain classified as; agricultural - 15,546 ha., pastureland - 17,808 ha., forest area - 7,305 ha., and residential – 394ha. Farming is the main occupation of the populace and the main agricultural crops are corn, tobacco, peanuts, gabi, banana and vegetables such as squash, beans, cabbage, ampalaya and others (DILG-CAR, Almanac, 1999). The purpose of this study therefore, was to assess the level of knowledge and awarenessof IPM among corn farmers in the municipality of Alfonso Lista, Ifugao.

2. Material and Methods

This study was conducted in the municipality of Alfonso Lista, Ifugao province, Philippines (Figure 2.1). Majority of farmers in this municipality are corn farmers. A total of 15 out 20 barangays constituting the municipality of Alfonso Lista were used to collect data (table 5.1). These barangay' were chosen because corn is the main crop planted in the area. The sample size was 400 respondents.

Figure 2.1: Study locations: Municipal of Alfonso Lista, Ifugao Province, Philippines

A survey questionnaire was employed as an instrument for this study. The instrument consisted of seven sections namely;

1. Demographic profile of respondents,
2. Farming practices of respondents
3. Knowledge of pest management of respondents
4. Attitudes toward pesticide use of respondents
5. Knowledge of IPM technology of respondents
6. Attitudes toward pesticide use of respondents
7. Communication variables of respondents

The questionnaire was subjected to a pilot study to determine its reliability for the study. Computed Cronbach's Alpha score was 89.0%, this score indicated that the reliability of the questionnaire was acceptable for the study.

Table 2.1: Listof representative barangays of Alfonso Lista use in the study

Municipality of Alfonso ListaIfugao
Barangay
Busilac
Caragasan
Kiling
Little Tadian
Namnama
Namillangan
Ngileb
Pinto
Poblacion
San Jose
San Juan
San Marcos
San Quintin
Santa Maria
Santo Domingo (Cabicalan)

3. Objectives of the Study

This study was conducted with the following objectives:

- To determine the demographic profiles of the respondents.
- To determine the knowledge/awareness level of IPM technology among the respondents.
- To determine areas where training regarding IPM technology is necessary for the respondents.
- To establish relationships between the independent variable of training, age and dependent variable of level of knowledge and awareness of the respondents.

4. Statistical Analyses

Data gathered was coded and analyzed using the statistical tool of Microsoft Excel 2007. Descriptive statistics such as mean, standard deviation, percentages were computed for the description of the data. The regression analysis was used to predict how much of variance in dependent variable of knowledge/awareness level accounted for by independent variables of training as well as the demographic profiles of the respondents. Regression analysis was also used to determine the relationships between each of independent variable and dependent variables.

5. Results and Discussion

The results of table 2 summarize the demographic profile and descriptive statistics for the respondents. The result indicates that 67% of the respondents are between the ages of 31-50 years old with 69% as male and 31% female. Less than half of the respondent (28%) have high school graduate diploma while 6% are college graduates.

Table 5.1: Demographic profile of respondents

Age	67% (31-50yrs)
Gender	Male (69%)
	Female (31%)
Education	High School Graduate (28%)
	College Graduate (6%)
Farming experience/year	58% (5 -10yrs)
	42% (11-20yrs)

The results also show that 58% of the respondent have farming experience of 5 to 10 years while 42% have farming experience of 11 to 20 years. These results show that the respondents are of mature age with average to low education attainment.

Table 5.2shows the level of knowledge and awareness of respondent in areas of IPM technology and concept. The result indicates that the respondents have very low knowledge of IPM technology and concept. These concept includes; knowledge and awareness in other methods for the control insect infestation (1.01),knowledge of other methods for controlling weeds (1.25), spraying chemicals that kill natural enemies can cause pest infestation (1.46), knowledge of natural enemies of pest (1.37), timely sowing can reduce insect/pest population (1.56), crop rotation (1.75).

The result also shows that the respondents relies more on pesticides for the control of insects (4, 25) and weeds (3.27) than applying IPM technology and concept to remedy pest occurrences.

Table 5.2: Means, standard deviations for the level of knowledge and awareness of respondent in areas of IPM technology and concept

Knowledge/ Awareness level in IPM Technology (Statements)	*Mean*	*Standard Deviation*
Relies only on insecticides for controlling insects	4.25	0.94
Relies only on herbicides for controlling weeds	3.27	1.43
Knowledge of other methods for the control insect infestation	1.01	0.10
Knowledge of other methods for controlling weeds	1.25	0.60
High percentage of insects are killed with insecticide	4.07	1.70
Source of pest control advice is from legal authorities	2.03	1.64
Spraying chemicals that kill natural enemies can cause pest infestation	1.46	0.58
Knowledge of natural enemies of pest	1.37	0.56
Timely sowing can reduce insect/pest population	1.56	0.50
Crop rotation	1.75	0.86

*Mean: 1= none, 2=low, 3=moderate, 4=high, 5=very high

These findings show that the respondents do not have enough knowledge and awareness in most of the major IPM technology and concept which is necessary for adoption and application. High level of knowledge is required for proper application of IPM technology. In similar studies, various authors (David 2007; Erbaugh et. al 2007), have also indicated the lack of knowledge/awareness of IPM technology and concept among farmer of various crops.

In regard to the level of exposure to trainings and information's concerning IPM technology shown in table 5.3, the respondent were rated on a 5-point Likert scale where 1= None, 2=Low, 3=Moderate, 4=High, 5=Very high. The means ranged from none (1.08) for electronic media frequently use to low (1.79) for publications available and trainings attended (1.78). It is evident from the results that the respondents have not attended training on IPM technology as well as having the opportunity to information through print media. According to Ashraf (2007), Hussain, et.al. (2011), trainings, publications, seminar/workshops are important avenues through which IPM technology and concepts are introduced to farmers to enhance their knowledge and awareness level. When farmers are enriched with quality knowledge of IPM technology and concepts, adoption and implementation becomes easier as farmers sees the greater impact and advantage in crop production and agricultural sustainability as a whole.

Table 5.3: Means, standard deviations for the level of training and information concerning IPM technology of the respondents

Knowledge/ Awareness level in IPM Technology	Mean	Standard Deviation
Publications	1.79	1.33
Pest management training attended	1.78	0.51
Knowledge of IPM technology through training	1.75	0.50
Seminars/workshops	1.46	0.77
Neighbors/other farmers	1.21	0.41
Electronic media frequently use	1.08	0.31

*Mean: 1= none, 2=low, 3=moderate, 4=high, 5=very high

6. Correlation Analysis

The relationship between independent variables and dependent variable was measured using Spearman coefficient. Table 5.4 shows that there was a relationship between independent variables of training, education and age of respondent and the dependent variable of knowledge/awareness of IPM technology and concepts. This indicates that lack of training coupled with low level of education as well as age of the respondent played a major role in their low levels of IPM knowledge and awareness, thus, it is important to note that improving farmer's knowledge through training is a strong catalyst for IPM adoption and implementation.

7. Regression Analysis

In order to explain variation in the extent of IPM knowledge/awareness practices among corn farmer, a multiple regression analysis was conducted for the independent variables of age, education, and the dependent knowledge/awareness level of IPM technology through training (Table 5.5). The model was significant at $p < 0.0001$. The R square values of 0,677 reveals that 67.7% of the variation in the extent of IPM knowledge/awareness. This shows that age, education, trainings as independent variables play a major role in knowledge/awareness of IPM technology and concepts among the corn farmers. The results of correlation and regression model show that there is a negative correlation between age and knowledge/awareness indicating the possibility that some of the older respondent do not know about IPM technology and concepts. In similar studies, Banjo et.al (2010), Belay, K. (2003), Drost et.al (1996), reported that education and training are important variables that play effective roles in the adoption and implementation of IPM technology and concepts

Table 5.4: Correlation measures between independent variables and dependent variables

Independent Variables	*Dependent Variables*	*r*	*p*
Training and information	Knowledge/ awareness of IPM	0.271	0.001*
Education	Knowledge/ awareness of IPM	0.269	0.001*
Age	Knowledge/ awareness of IPM	0.243	0.001*

***p<0.05*

Table 5.5: Regression analysis for knowledge/awareness (DV)

Variables	*Coefficients*	*Std. Error*	*t*	*Sig. level*
Constant	17.568	0.162	3.055*	<0.001
Age	-0.661	0.379	-3.078*	<0.001
Education	3.480	0.798	4.828*	<0.001
Knowledge of IPM technology through training	1.055	0.198	6.482*	<0.001

R^2 = .677; Adj. R2 =.665; df= 4, 44; F= 43.205
*Significant at .05 level

8. Conclusion and Recommendations

This study provides conclusive evidence that knowledge and awareness levels of IPM technology and concepts are low among corn farmers in Alfonso ListaIfugao, Philippines. The results also indicated that majority of the corn farmers have limited access to information's and training regarding IPM technology. IPM strategies such as; crop rotation, using resistant varieties, minimal use of pesticide and good farm sanitation practices should be adopted by these corn farmers. IPM technology and concepts therefore, should be extended to corn farmers in Alfonso LiataIfugao through trainings, seminars, publications as well as through any form of mass mediaavailable . With a huge area of 15,546 ha of agricultural land in Alfonso Lista, Ifugao, an immediate action to implement IPM technologies and concept is hence deemed necessary for agricultural and environmental sustainability.

IPM methods are aimed at suppressing insect and disease populations to levels that do not cause economic damage. IPM methods are not directed to a total eradication of a pest. Insect natural enemies are important in other to keep a balance in the ecosystem.

These technologies and concepts when adopted and implemented will result in sustainable environments that will enhance crop production, increase income of farmers as well as sustain food security.

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