



Extension knowledge needs of farmers in the field of extensional recommendations for the use of agricultural pesticides in sharbazher district - Sulaymaniyah Governorate

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Abstract

The aim of the research was to determine extension knowledge training needs of farmers in the field of extensional recommendations for the use of agricultural pesticides and their effects. The research data was collected using a questionnaire by personal interview for a random sample consisting of 123 farmers representing 5% of the research population (2455), which were. To measure the validity of the research tool, it was presented to specialists in the fields of extension and plant protection, the reliability coefficient was calculated through an exploratory sample outside the study sample by split half method, and its value was (0.82). After final modifications, the questionnaire was used to collect data from the research sample. Finally, the software SPSS ver22 was used for data analysis. The results showed that the majority of farmers their extension knowledge training needs were medium, the economic effects occupied the first rank in terms of training needs, while the environmental effects occupied the last rank. as well as the results appeared there is a significant difference in training needs according factors (land area, family help, training courses), while no significant differences according to variables (age, level of education, the amount of pesticide use, use alternative of pesticide, source of information). The research recommended increasing training activities in the field of agricultural pesticides according to their training needs, focusing the courses on the economic effect aspects, and paying more attention to farmers to participate in training courses in this field and urging them to use alternatives to pesticides.

Key words: Pesticide, Pest, Agricultural Pesticide, Training, Training needs.

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Introduction

Pesticide is a substance or mixture of substances intended for repelling, preventing, destroying, or mitigating the pest. Pests defined as an organism that causes plant diseases. farmer's used agricultural pesticides to prevent the effect of the pests on the growth and productivity of agricultural crops, Pesticides are substances that meant to control pests. The concepts of pesticide contain the following: herbicide, insecticides (which include insect growth regulators, termiticides, etc.) molluscicide, nematocide, piscicide, avicide, rodenticide, bactericide, insect repellent, antimicrobial, animal repellent, and fungicide [1]. The most common pesticide use are herbicides which account for approximately 80% [2]. Generally, pesticides are intended to serve as plant protection products, also called crop protection products, which preserve plants from weeds, or insect's fungi, as an example fungus *Alternaria* is used to combat the Aquatic weed, *Salvinia*. Pesticide is a chemical such as carbamate or biological agent such as a virus, bacterium, or fungus that deters, incapacitates, kills, or otherwise discourages pests. Target pests contain insects, plant pathogens, weeds, birds, molluscs, mammals, fish, nematodes (roundworms), and microbes that destroy property, cause nuisance, spread disease and are disease vectors, The risk of pesticide depends on two things, exposure (**how much?**) and toxicity (**how poisonous?**). The **exposure** is the amount that get in your body, or the amount is released into the environment. The pesticide **toxicity** is measured by how poisonous to people and the environments, Pesticides often contain more than one ingredient, and each one may have a different toxicity. The simple approach to evaluate the toxicity of a pesticide product is to

shed light on the signal word. Most pesticides have either the word caution, warning, or danger on the label, and that signal word reflects the toxicity of the product [3].

The trade in chemical agricultural pesticides is a source of huge profits for manufacturers, and most of them have concluded deals in poor countries[4] . Pesticides are potentially toxic to humans and especially for those who work on or had contact with it. Pesticides play a key role in food production; protecting or increasing yields and the number of times per year a crop can be grown on the same land, particularly important in countries that face food shortages. FAO and WHO are responsible for assessing the risks to humans of pesticides both through direct exposure, and through residues in food and for recommending adequate protection[5]. Most of pesticides used in desert locust control pose a risk to the environment and human health, even if it is used judiciously [6]. A considerable proportion of the pesticides still being used in the world can be considered highly hazardous, because they have a high acute toxicity, known chronic toxic effects even at very low exposure levels, very persistent in the environment and in organisms. In developing countries, Highly Hazardous Pesticides (HHPs) may pose significant risks to human health and the environment, because risk reduction measures such as use of personal protective equipment or maintenance and calibration of pesticide application equipment are not easily implemented or non-effective. Pesticide risk reduction is one of the priority areas in FAO's pesticide management programme, which confirmed by the FAO Council, that suggested the priority activities for FAO within SAICM "could include risk reduction, including the progressive ban on highly hazardous pesticides" [7].

Obsolete pesticides and contaminated materials can pose a direct threat to public health and the environment. The reasons contain as follow:

- Lack of information or understanding of the hazard posed by the pesticide by the various stakeholders from original supplier to end user;
- Inadequate training of farmers, government inspectors and store managers on risk data and stock control; [8].

Among the most recent studies an Egyptian study conducted by a team from Mansoura University in cooperation with the University of Munich in Germany, which confirmed that excessive exposure to pesticides increases the risk of farmers developing Parkinson's disease [9].

Whereas, a master's thesis entitled "Agricultural Pesticides and Impact on Health in the Governorates of Gaza" revealed an increased risk of farmers becoming infected with a number of diseases, including kidney and liver failure, nervous system diseases and cancerous tumors; As a result of excessive use of pesticides and indicated that there are a number of pesticides that have an effect on fetuses, a number of others that have caused tumors to appear in experimental animals, and a number of others that negatively affect the physiological functions and internal organs in the human body, pesticides that affect fertility and cause sterility. [10]. Similar results were reached by the Agricultural Health Project, which is a series of studies conducted by researchers from the National Cancer Institute in the United States of America, the National Institute of Environmental Health Sciences, and the Environmental Protection Agency, verified the impact of pesticides and agricultural activities on health, and successive studies revealed that increased exposure Pesticides lead to higher rates of farmers' infection with diseases such as prostate and lung cancer, diabetes, Parkinson's, hypothyroidism and multiple myeloma [11].

The unconscious and indiscriminate uses of chemicals and pesticides, in turn, led to the emergence of many negative effects because they were not used according to precise standards. They have experience and information on the rational use of them or the available alternatives such as organic fertilizers and biological control in order to reduce the damages of chemicals to environmental science with all its components, and since farmers are primarily responsible for using these materials in the field in order to increase their products and eliminate the harmful causes in the field. Farmers have knowledge and scientific awareness in the use of agricultural pesticides in a healthy and safe way and the harm it causes to itself, its crop and its environment [12]. In order to overcome situation, it is required to organize important extension training courses planned on a scientific basis to be the correct way to raise the efficiency of all farmers. In order these programs to be correct in planning and achieving desired goals, it is necessary for the planner to be fully aware of the training needs of farmers. Therefore, the situation requires studying and knowing the training needs of farmers in the importance and use of agricultural pesticides in order to represent the correct entry point for training [13] This is what prompted the researcher to conduct this study aimed at knowing the training needs in some of the indicative recommendations in the field of agricultural pesticide use in the Sharbazher area in the Sulaymaniyah governorate. From this point the research problem was identified through the following research questions:

1. What are the extension knowledge needs of farmers in the field of extensional recommendations for the use of agricultural pesticides and their effects in Sharbazher district - Sulaymaniyah Governorate?
2. What are the extension knowledge needs of farmers in the field of extensional

recommendations for the use of agricultural pesticides and their effects in Sharbazher district - Sulaymaniyah Governorate in the field of (using pesticide, field effects, economic impact, environmental effects)?

3. What are the variance between extension knowledge needs according to some variable (Age, Level of Education, Land area, family help, amount of pesticide use, use alternative of pesticide, training courses, sources of the information)?

Research objective:

1. Determine the extension knowledge needs of farmers in the field of extensional recommendations for the use of agricultural pesticides and their effects in Sharbazher district - Sulaymaniyah Governorate.
2. Determine the extension knowledge needs of farmers in the field of extensional recommendations for the use of agricultural pesticides and their effects in Sharbazher district - Sulaymaniyah Governorate in the field of (using pesticide, field effects, economic effects, environmental effects).
3. Identify the variance between extension knowledge needs according to some variable (Age, Level of Education, Land area, family help, amount of pesticide use, use alternative of pesticide, training courses, sources of the information).

Material and methods:

Research methodology:

This research comes as the framework of the diagnostic research within the descriptive approach [14], the questionnaire prepared as a tool to collect the data by face to face method about the subject of the research and to make it appropriate for the research methodology. Questionnaire is considered as a convenient tool to get the information, data and facts; it gives more objective data than other data

collection methods to achieve the objectives of the research.

Research zone: This research conducted in Sharbazher district of Sulaymaniyah governorate of the Kurdistan Region-Iraq. It consist of six sub-district, located in the northeast of sulaymaniyah due to its geographical location it has cold and snowy winters and moderately cool summers. Sharbazher is a mountainous and agricultural area , people are engaged in agriculture profession, especially vegetables, fruits, beekeeping and livestock.

Research population and its sample:

The research population involved all farmers in Sharbazher district in Sulaymaniyah governorate of the Kurdistan Region-Iraq, they were (2455) farmers *. The sample of the research included (123) respondents representing nearly (%5) of the population, taken by a simple sampling random method.

Data collection tool:

The questionnaire was used to collecting the data as a tool related to the research objectives which consisted of two parts: The first part: Included a number of questions related to the personal characteristics of the farmers, including (Age, Level of Education, Land area, family help, amount of pesticide use, use alternative of pesticide, training courses, source of the information). The second part: included a test (multiple choice) to measure the level of knowledge of farm in the field of the use and impact of agricultural pesticides which the Extension Knowledge Needs farmers can be estimated . It consists of (56) items distributed over (4) fields, as follows: The field of using pesticide (28) items, field effect (11) items , economic effects (7) items and environmental effects (12) items, The relative importance of the above fields was determined by the experts as follows (%19.5, %25.5, %21.5, %33.5),

respectively. the level of extensional need of the respondents were determined by subtracting the current level of information from the required level of information (target) as follows: extension knowledge need = required level of information - current level of information. (100) degrees were adopted as the

Validity and Reliability:

Reliability was measured through the exploratory sample of 30 respondents, outside the study sample, and followed the split half method by using Pearson's correlation coefficient and using the Spearman-Brown equation., and its value was (0.82), which indicates that the scale is stable and suitable for data collection in order to achieve the validity of the content, the questionnaire was presented to a group of specialists in the fields of agricultural extension, and plant protection, depending on their views, the items were reformulated . After final modifications, the questionnaire was used to collect data from the research sample. Finally, the software SPSS ver22 was used for data analysis which included frequency, mean, standardized score,

basis for the standard result of the required level of information and these degrees were distributed among the field according to their importance and in light of the experts' estimates of the relative importance of the fields as indicated above.

relative importance, t-test and analysis of variance.

Result and discussion:

1. Determine the extension knowledge needs of farmers in the field of extensional recommendations for the use of agricultural pesticides and their effects.

The respondents were distributed according to the degrees of their needs into three levels by converting these degrees into standard scores. It appears from (Table 1) that 71.54% of the farmers indicated their needs were medium. This result indicates that the farmers need extension knowledge about pesticide use and its and their residues in order to attention in raising their level of knowledge and awareness towards agricultural pesticides in all its aspects.

Table (1): total degree of extension knowledge needs in using and effect of pesticide in general

Level of needs	Standard score	Frequency	Percentage%	Mean of Total needs
Low	Less than -1	17	13.83%	24.52
Medium	between(-1 , +1)	88	71.54%	39.12
High	More than +1	18	14.63%	57.61
	Total	123	100.0%	

2. Determine the extension knowledge needs of farmers in the field of extensional recommendations for the use of agricultural pesticides and their effects in the field of (using pesticide, field effects, economic effects, environmental effects).

To identify the extension knowledge needs in each fields of research, the fields were arranged according to the level of their needs.

It is appeared that the "economic effects " was rated at the first rank with the relative importance of (51.9%). This result referred to lack of understanding and knowledge of the economic effects caused by the use of agricultural pesticides, such as wasting a lot of money and increasing the cost of production as well as negative effect on the quality of the crop and decrease all other wealth's such as

livestock and bees, and as a result, revenue and income decrease. while the "environmental effects " was occupied the lowest ranking with the relative importance of (30.32%). This result may be attributed to that they know the

pesticides are dangerous chemicals that harm the environment and its components and pollute land and water, as described in (Table 2,3).

Table (2): Arranging the extension knowledge needs aspects according to their relative importance

No.	Training needs aspects	Minimum Value	Maximum Value	Mean Value	Std. Deviation	Standard Degree	Relative importance	Rank
1	Economic effects	2.9	21.5	11.16	3.82	21.5	51.90%	1
2	Using pesticide	2.25	14.25	8.20	2.24	19.5	42.5%	2
3	Field effects	2.5	18.60	10.27	3.84	25.5	40.27%	3
4	Environmental effects	2.7	22.3	10.16	5.15	33.5	30.32%	4

Table (3): total degree of training needs in using and effect of pesticide in each aspects

fields	Level of training needs	Standard score	Freq.	%	Mean of needs	Total Mean	Relative importance
Using pesticide	Low	Less than -1	12	9.7	4.6250	8.2012	42.5%
	Medium	between(-1 , +1)	84	68.3	7.6786		
	High	More than +1	27	22	11.4167		
	Total		123	100			
Field effects	Low	Less than -1	17	13.8	4.25	10.27	40.27%
	Medium	between(-1 , +1)	90	73.2	10.21		
	High	More than +1	16	13.0	17.01		
	Total		123	100			
Economic effects	Low	Less than -1	20	16.3	5.53	11.16	51.90%
	Medium	between(-1 , +1)	68	55.3	10.33		
	High	More than +1	35	28.5	16.00		
	Total		123	100			
Environm ental effects	Low	Less than -1	14	11.4	2.69	10.16	30.32%
	Medium	between(-1 , +1)	88	71.5	9.35		
	High	More than +1	21	17.1	18.56		
	Total		123	100			

3. Identify the variance in extension knowledge needs according to some variable.

1. **Age:** Table (4) shows that the majority of farmers (36.6%) are within the age range of (55 - 66), years. F- test was used to find the

difference in training needs. The calculated F-value is (0.73), is less than the table value, this mean that there is no significant difference in training needs according to age, this may be due to the majority of farmers have the same training needs about

agricultural pesticides, regardless of their age, as it is appeared in (Table 4).

2. **Level of education:** The results showed that the majority of the farmers nearly (60.3%) in the (Illiterate and primary) level of education. To find the differences in training needs, the analysis of variance (F) was used. as it is appeared in (Table 4), the calculated F-value (1.75) is less than the table value. This mean that there is no significant difference in the training needs according to the level of education. It is confirming that the level of education is not related to the training needs. It means that the farmers have the same amount of information and knowledge of pesticides.
3. **Land area:** It is appeared from the results that most of the farmers are belong to the (1 – 11) dunums category. To find the differences in training needs, the analysis of variance (F) was used. As it is appeared in (Table 4), the calculated F-value (3.05) is more than the table value. This mean that there is a significant difference in the training needs according to the land area. This result is confirming that the land area is related to the training needs. It may be attributed the owners of the few lands are not trying to increase their knowledge, or they may not care about pesticides or they do not take the risk of developing their projects.
4. **Family help:** The results showed that the majority of the farmers (82.93%) their family helps them. T-test is used to find the differences in training needs. The calculated t-test (2.92), is more than the table value, this mean that there is a significant difference in the training needs according to the family help. It may be attributed the farmers who are helped by their families are less experienced and knowledgeable and dependent on them.
5. **Extent pesticide use:** The results showed that the majority of the farmers nearly (48%) use Scarcely pesticide. Analyses variance was used to fine the differences in training needs. As it is appeared in (Table 4), the calculated F-value (0.65) is less than the table value. This mean that there is no significant difference in the training needs according to the amount pesticide use. It means no related to the training needs.
6. **Extent use alternative of pesticide:** The results showed that the majority of the farmers nearly (464%) use always of alternative of pesticide. Analyses variance was used to fine the differences in training needs. As it is appeared in (Table 4), the calculated F-value (2.8) is less than the table value. This mean that there is no significant difference in the training needs according to the use alternative of pesticide use. It means no related to the training needs
7. **Training courses:** It is appeared from the results that most of the farmers (82%) not participant in training courses. T-test is used to find the differences in training needs. The calculated t-test (2.37), is more than the table value, this mean that there is a significant difference in the training needs according to the training courses, it may be attributed the farmers who participate in the training courses have experience, information, and knowledge about agricultural pesticides, and their need is less concerned compared to those who did not participate.
8. **Exposure to information sources:** The results showed that the majority of the farmers nearly (65%) from the category of medium information sources. Analyses variance was used to fine the differences in training needs. As it is appeared in (Table 4), the calculated F-value (1.37) is less than the table value. This mean that there is no significant difference in the training needs according to the source of information. It means the source of information is no related to the training needs.

Table (4): Differences in extension knowledge needs according to some variables

Variables	Categories	Freq.	%	Mean of training needs	t-value F-value	Significance
Age/ years	19 - 28	6	4.9	46.68	F 1.65	0.15 N.S
	29 - 38	26	21.1	36.80		
	39 - 48	35	28.5	42.76		
	49 - 58	29	23.6	38.03		
	59 - 68	17	13.8	39.16		
	69 - 78	10	8.1	39.48		
Level of Education	Illiterate	16	13.0	40.34	F 1.75	0.11 N.S
	Reads and writes	30	24.4	40.85		
	Primary	43	35.0	42.09		
	Intermediate	15	12.2	36.11		
	High school	4	3.3	39.14		
	Diploma	7	5.7	29.92		
Land area/dunum	1 - 11	101	82.1	40.90	F 3.059	0.050 Sig
	12 - 22	13	10.6	34.31		
	23 & more than	9	7.3	35.53		
family help	No	21	17.07	35.51	t 2.92	0.005 Sig
	Yes	102	82.93	40.69		
Extent pesticide use	Scarcely	60	48.8	38.68	F 0.65	0.52 N.S
	Sometimes	37	30.1	40.78		
	always	26	21.1	41.03		
Extent use alternatives of pesticide	Scarcely	79	64.2	41.08	F 2.80	0.065 N.S
	Sometimes	38	30.9	38.51		
	always	6	4.9	31.31		
training courses	Participant	22	17.89	35.00	T 2.37	0.019 Sig
	Non participant	101	82.11	40.86		
Exposure to information sources	Few (1 – 4)	30	24.4	38.10	F 0.50	0.60 N.S
	Medium (5 – 8)	83	67.5	40.33		
	A lot (9 – 12)	10	8.1	40.61		

Conclusion:

1. The study results appeared the total mean of extension knowledge needs nearly (88%) are medium. We conclude that the efforts of the responsible authorities, especially the Ministry of Agriculture, are not sufficient in terms of educating them, training them, helping them, and increasing their expertise, especially pesticides, as they are

chemicals that need caution and extra attention.

2. The field of economic effect occupied the first rank from the extension knowledge needs, we conclude from this that the farmers need to training and awareness in terms of increasing their knowledge of farm management and their projects and the economic damage caused by pesticides. while the environmental effect occupied the

last rank, we conclude the farmers have knowledge and information about the damage caused by pesticides to the environment, considering that pesticides are chemicals that have negative effects despite the use of pesticides for agriculture.

3. Age is not related to the extension knowledge needs, we conclude from this all categories of the ages have a same knowledge or all ages needs to the training courses of agricultural pesticide, then level if education is not related to the training needs, we conclude the education does not affect training needs and all farmers of the all levels of education need training in the field of agricultural pesticides.
4. Land area related to the extension knowledge needs, we conclude farmers who own large areas have more knowledge and experience in the use of pesticides and know the extent of their danger and depend on the safety of their lands in other ways.
5. Family help related to the extension knowledge needs, we conclude farmers who depend on the help of their families have little knowledge and experience, and therefore their need for training is high compared to others.
6. The amount of use of pesticides and alternatives is not related to extension knowledge needs, although farmers who use a small percentage, their training need is less compared to others because they know the extent of its dangers and negative effects, at the same time, farmers who use pesticide alternatives in a large percentage have less training need compared to others.
7. Training courses is related to the extension knowledge needs, we conclude farmers who participate in training courses increase their

information and knowledge about pesticides, and thus their need for training decreases, and vice versa.

8. Source of information is not related to extension knowledge needs; we conclude Information sources did not change in their level of information of pesticide or did not benefit from it.

Recommendations:

1. Depending on the results, the responsible authorities should increase their training activities in the field of agricultural pesticides according to their training needs and encourage farmers to participate in training courses because this field is directly related to the environment, health and agricultural production.
2. The agricultural extension authorities should focus the training courses on the economic aspect in the priorities of the course topics and educate farmers about the economic effects resulting from the use of pesticides.
3. Agricultural extension should pay attention for the farmers to participate in training courses regardless of their age, level of education.
4. Focusing by agricultural extension organizations to participate the farmers in the training courses especially farmers whose lands are limited, meaning small producers, and who depend on their families.
5. Extension departments should pay more attention to farmers to participate in training courses to increase their negative attitudes towards agricultural pesticides and urge them to use pesticide alternatives.

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الحاجات الارشادية المعرفية للمزارعين في مجال التوصيات الارشادية المتعلقة باستخدام المبيدات الزراعية في قضاء شاربازير بمحافظة السليمانية

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• تاريخ استلام البحث 2023/2/28 وتاريخ قبوله 2023/3/13

المستخلص

استهدف هذا البحث تحديد الحاجات الارشادية المعرفية للمزارعين في مجال التوصيات الارشادية المتعلقة باستخدام المبيدات الزراعية وتأثيراتها. تم جمع البيانات من عينة عشوائية بسيطة بحجم (123) مزارعا يمثلون (5%) من مجتمع البحث البالغ عددهم (2455) مزارعا ، و ذلك عن طريق استمارة استبيان خاصة تم تصميمها لتحقيق اهداف البحث وقد تم عرض الاستمارة على عدد من المتخصصين في مجال الارشاد الزراعي و وقاية النبات ، كما وتم حساب معامل الثبات بطريقة التجزئة النصفية و باستخدام معامل ارتباط بيرسون وباستخدام معادلة سيبرمان - براون وكانت النتيجة (0.82). بعد الانتهاء من جمع البيانات و تفرغها و تبويبها و تحليلها باستخدام عدد من الوسائل الاحصائية عن طريق البرنامج الاحصائي SPSS ver22. أظهرت نتائج البحث أن غالبية المزارعين كانت احتياجاتهم الارشادية المعرفية متوسطة حيث بلغ نسبتهم 71% ، و جاءت التأثيرات الاقتصادية المرتبة الاولى ، بينما احتلت التأثيرات البيئية المرتبة الأخيرة ، كما اظهرت النتائج وجود فروق ذات دلالة إحصائية في الحاجات الارشادية المعرفية حسب المتغيرات (مساحة الارض ، المساعدة الأسرية ، الدورات التدريبية) ، بينما لا توجد فروق ذات دلالة إحصائية حسب المتغيرات (العمر ، المستوى التعليمي ، مدى استخدام المبيد ، مدى استخدام بديل للمبيد ، التعرض لمصادر المعلومات). وأوصت الدراسة بزيادة الأنشطة الارشادية في مجال المبيدات الزراعية و ذلك بهدف تزويد المزارعين بالتوصيات العلمية المتعلقة باستخدام المبيدات الزراعية و تطبيقها بصورة صحيحة ، و تركيز الدورات على جوانب الأثر الاقتصادي ، وإيلاء مزيد من الاهتمام للمزارعين للمشاركة في الدورات التدريبية في هذا المجال ، وحثهم على استخدام بدائل للمبيدات.

الكلمات المفتاحية: المبيدات ، الآفات ، مبيدات الآفات الزراعية ، التدريب ، الحاجات التدريبية.