Plant Archives Vol. 21, Supplement 1, 2021 pp. 2306-2312 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org
doi link : https://doi.org/10.51470/PLANTARCHIVES.2021.v21.S1.378

A STUDY OF AWARENESS OF THE NEGATIVE EFFECTS OF USING PESTICIDES IN AGRICULTURAL EMPLOYEES WORKING IN THE AGRICULTURAL DIVISIONS OF AGRICULTURE DIRECTORATE AT NINEVEH CITY OF IRAQ

Haider Wali Abd Wali and Ahmed Awad Talb Altalb
Department of Agricultural Extension and Technology Transfer, College of Agriculture and Forestry, University of Mosul, Iraq

ABSTRACT

The research aims to identify the level of awareness of agricultural employees working in the agricultural divisions of the Nineveh Governorate Agriculture Directorate about the negative effects of the adverse use of pesticides in general, and in each of the research domains, to identify the correlation between the awareness of agricultural employees of the negative effects of the use of pesticides and the independent variables that are included in the research (age, educational level, gender sex, housing, place of education, years of service for the agricultural employee, agricultural specialization participation in training and the agricultural information sources).
The research community included all the agricultural employees working in the agricultural divisions of the Nineveh Governorate Agriculture Directorate, the total number is (227) employees, and the simple random sampling method was used in selecting the research sample, after excluding (30) employees were used to measure the scale of stability of the research out of the whole research community, thus the total number was (186) of the agricultural employees). A simple random sample of (75%) was taken, and thus the number of employees in the research sample was(151 agricultural employees.research sample , and after completing the data collection of the survey sample and the validation of the research scale, the final research data collected during the period from 1/11/2019 to 6/12/2019, as the research data was collected from the agricultural employees working in the agricultural divisions of Nineveh Agriculture Directorate through personal interviews and a postal questionnaire and by the assistance of some agricultural employees in the Agricultural Division, and the data was analyzed statistically using many statistical means. The most important ones are: Frequencies, Percentages, Range, Mean, Person's Correlation Coefficient, and Spearman Brown's correlation coefficient. The results of the research showed that the awareness of agricultural employees working in the agricultural divisions in Nineveh Governorate about the negative effects of using pesticides was generally moderate. The results also showed a correlation between the level of awareness of agricultural employees working in the agricultural divisions and the following independent variables (age, educational level, gender, housing, number of years of service in the agricultural sector, academic specialization, training sessions in the use of pesticides). There is no significant correlation between the level of awareness of agricultural employees working in the agricultural divisions and the following independent variables (age, educational level, gender, housing, number of years of service in the agricultural sector, academic specialization, training courses in the use of pesticides. The researcher recommends increasing the awareness of employees working in the agricultural divisions in Nineveh Governorate in the fields of pesticide use in general and in the fields (human beings, animals, soil, plants, water and air).

Introduction

The Agricultural development is considered as one of the important bases in the economic and social developments, its importance increases, especially in the developed countries, where the agricultural sector is the main bases of the national economy. Agricultural development is an urgent necessity at the present time more than ever because it aims to achieve high levels of productivity in the agricultural sector (Saleh *et al*., 2004; Arab Organization for Agricultural Development, 1997; Al-Al-Sabbagh, 1998). The government has contributed to the development of the agricultural sector and has given it great importance through the introduction of modern agricultural technologies into the production process, including the provision of all agricultural requirements of agricultural machinery and machinery and pesticides (Al-Daodi, 2003 and Altalb, 2005).

The agricultural sector is one of the important economic activities and constitutes a source of food and national income in most countries of the world (Arab Organization for Agricultural Development, 2007). It also provides the most essential and vital human needs, which is food, in addition to being the source that supplies the manufacturing industries with raw materials, in addition to the prominent positive role that agriculture can play in exports and the saving of currency, Al-(Jubouri, 2006; Nana and others, 2007). The advancement of this sector has become one of the basic matters in the state's orientations and requires concerted efforts to achieve an increase in production as one of the basic bases to confront the food shortage in exchange for the increase in population (Al-Azzawi, 1999).

In fact agriculture can advance the development wheel by connecting between agriculture and other service activities (Khoury and Adnan, 2004). As it is known that the

integrated agricultural development depends on two basic elements: the material element and the human one, the material element is represented by the various scientific and technical aspects that emerged from the results of research and studies in all sciences related to agricultural production, while the human element is the effective tool that works to use the material element in its various aspects in a form that leads to achieving agricultural development (Al-Maamouri, 2002) Many studies of the Arab Organization for Agricultural Development indicated that one third of agricultural production in the Arab region is destroyed by pests, whether during the period of crop growth in the field or during harvest or storage (Arab Organization for Agricultural Development, 2001), therefore, there was an urgent need to use chemical pesticides to resist agricultural pests to limit their damage to agricultural crops as one of the weapons for maximizing agricultural production (Fawy *et al*., 2000). Pesticides are a general term that includes insecticides, rodenticides, herbicides, and fungicides. These materials are characterized by the ease of manufacturing and the intensity of their effectiveness against agricultural pests (Al-Otaibi, 5).

In fact, chemical pesticides are deadly toxins that harm living organisms and damage biodiversity and the ecosystem (Arab Organization for Agricultural Development, 2001). The analyzes showed the presence of a high percentage of DDT. The widespread use of pesticides is usually accompanied by strong harmful effects on humans, animals, plants and fish (Hassan, 2007). The frequent use of pesticides in agriculture resulted in bad consequences for public health and leading to environmental pollution (Hassan, 2004). In addition to this, the increase in production costs due to the diminishing returns of the chemical control operations (Arab Organization for Agricultural Development, 1995). In fact, the chemical pesticides are deadly toxins that harm living organisms and damage biodiversity and the ecosystem (Arab Organization for Agricultural Development, 2001).

As for the environmental considerations, the unconscious use with high concentrations of toxic pesticides affects the ecosystem to comprise water, land, and gas) and shows the effects of the bad use of pesticides on non-target organisms in the environmental community, whether it is a lethal effect or an effect related to the rate of reproduction and the extent to which the production of individuals of these organisms is achieved, the bad use of pesticides may cause a state of imbalance among pests and their vital enemies in the environmental community, as well as their accusation to be an indicator that pesticides and their excessive use as one of the causes of damage to the atmospheric ozone layer and the consequent climatic and environmental problems (Meyer, 2001).

All modern pesticides are a double-edged weapon. They are of certain benefit to the human beings as they are used properly and they will become extremely dangerous when being misused because their molecules have been designed and their preparations have been prepared not to harm living organisms, which include insects or fungal pests, weeds or rodents or spiders or other pests, and accordingly, all pesticides are considered unexceptionally toxins. In other words, dealing with them correctly makes them safer, and due to the biological active nature of pesticides, they are relatively a serious harm to human health and this is more evident to workers in industry and supplying, as well as workers deal with the application in the fields in general, and children who are exposed to these toxins, the waste problem represents a tremendous challenge to the use of chemical pesticides in the world, creating many dangers to human health as a result of the presence of pesticides on food crops (Fathallah, 2000), here, the role of agricultural extension appears as the agricultural extension institutions responsible for spreading agricultural and environmental awareness among all categories of agricultural pesticide users in agriculture and other uses, as well as raising awareness among pesticide users of the harm and negative effects resulting from the misuse of pesticides. In order to achieve the positive role of agricultural extension in raising awareness of the dangers of misuse of pesticides, this requires that the extension staff (workers in agricultural extension) have sufficient awareness and correct information about the dangers of misuse of pesticides.

2. Aims of the Research:

1. To identify the level of awareness of the agricultural employees working in the agricultural divisions of the Nineveh Governorate Agriculture Directorate of the negative effects of the bad use of pesticides. in general.
2. Identifying the level of awareness of agricultural employees working in the agricultural divisions of the Nineveh Agriculture Directorate of the negative effects of using pesticides in all the areas covered throughout the research.
3. Identifying the awareness of agricultural respondents on the negative effects of using pesticides in every domain of the research.4. To identify the correlation between the awareness of agricultural employees and the independent variables included in the research, namely (age, educational level, gender, housing, number of years of service for the agricultural employee, agricultural specialization and training courses in the field of pesticides) and between the variables mentioned.

Materials and Methods

The Research area and sample

Nineveh Governorate was chosen as an area to conduct the research, as Nineveh Governorate is located in northern part of Iraq and its center is the city of Mosul, and it is the second largest city in Iraq and one of the governorates famous for cultivating various types of agricultural crops. The research included Nineveh Agriculture Directorate, which includes (30) agricultural divisions and is distributed over the various districts of the governorate (*). The total research community included all agricultural employees working in the agricultural divisions of the Nineveh Agricultural Directorate, Table (1), as the simple random sampling method was adopted in selecting and determining the research sample, and the final research sample was (120) agricultural employees, who represented (75%) of the total research community after excluding (30) employees included for the measure ofthe research scale stability. Table (1) shows the distribution of Agricultural employees according to the agricultural divisions of Nineveh Agriculture Directorate.

Preparing the questionnaire form:

In order to obtain the datarelated to the research, a questionnaire form was prepared. The fields and the sections of the research were identified. Researches and resources

related to the research related to the subject of pesticides and their use were reviewed. After consulting specialists in agricultural extension and pesticides, a questionnaire was prepared.

The questionnaire form (research tool) consists of the following parts

components of the research tool (questionnaire form): The questionnaire form consisted of two parts as follows :

1. Part One:

It included information related to the independent variables related to personal, career and social variables of the agricultural employees in Nineveh Governorate, which are expected to have a relationship in the awareness of agricultural employees in using pesticides, namely (age, educational level, gender, housing, number of years of service in the agricultural sector, academic specialization, training sessions of how to use pesticides savely.

2. part two:

It includes the dependent variables (measuring the awareness of agricultural employees in using pesticides) as this part includes (6 areas) and sections (65 sections) were drawn up distributed on research areas as in the following table.

Table 2 : Distribution of sections on the fields of research (the fields of the questionnaire.

Fields	Number of items
The first field: the negative effects of using pesticides on humans	(9) items
The second field: the negative effects of using pesticides on animals	(15) items
The third field : the negative effects of using pesticides on soil	(10)items
The fourth field The negative effects of using pesticides on plants	(16) items
The Fifth field Negative effects of using pesticides on water	(6) items
The sixth field The negative impact of using pesticides on air	(9) items
The total number of sections	(65) items

Each section was preceded by, alternatives (I have not heard, just heard, just watched, heard and watched, heard, watched and discussed) and the numerical values were given respectively (1, 2, 3, 4, 5). By collecting the answers of each respondent on all the sections of the fields, the final score of the research obtained represented the level of environmental awareness of the agricultural employees in the use of pesticides. After completing the initial form, it was reviewed by the professors of the Department of Agricultural Extension and Technology Transfer to ensure the apparent validity. The form was also reviewed by the professors of the Department of Psychology / College of Education to verify the validity of the content of the measurement, After that, data was collected in November 2020.

Explanatory Sample

A preliminary test of the questionnaire was conducted on a sample of (30) respondents away from the main research sample, as the reliability of scale sections were found by the mid-segmentation method, as the reliability coefficient reached for all the sections (92.00),and the data of the survey in November 2020 was collected.

Measurements of the Independent Variables: The independent variables were measured as:

1. Age: It is measured by the number of years the age of the agricultural employee at the time of data collection. 2. The Educational level: The following scale was set for measuring it (graduate of high school of agriculture, graduate of an agricultural institute, graduate of the College of Agriculture and Forestry, diploma, masters, and doctoral degrees). These levels have been assigned numerical values (1, 2, 3, 4) respectively. 3. Gender: It was measured as (male, female), for which numerical values (1 and 2) were assigned to it, respectively 4.The place of residence: It was measured in terms of fixation / countryside, urban, as it was given the scores (1,2) respectively.

5. The number of years of service in the agricultural sector: It was measured by counting the number of years of service of the employee in the agricultural sector, as a score was given for each year.

6. Academic specialization: It was measured by asking the respondents whether they are specialists in agricultural extension or not and it was assigned numerical values (1 and 2) respectively.

Awareness Measurement

The needs for the farmers awareness were measured through the following alternatives opposite to each of these needs sections, which are (I have not heard, just heard, just watched, heard and watched, heard, watched and discussed), the numerical values were given (1, 2, 3, 4, and 5) respectively. After collecting the choices of the employees 'responses A total number was obtained representing (identifying the level of awareness of agricultural employees working in the agricultural divisions of the Nineveh Governorate Agriculture Directorate of the negative effects of the bad use of pesticides.

Statistical Means: Frequencies, Percentages, Ranges :

Pearson's Correlation Coefficient:

It was used to determine the relationship between the level of knowledge of the respondents and each of the whole independent variables involved in the research, namely (age, number of years of service in the agricultural sector), as well as to find the relationship between the odd and even sections to calculate the stability of half of the scale as a whole and calculate the scale of fields, according to the following law (Al-Janabi, 2013). The Coefficient of Hierarchical Correlation, Spearman Brown was used to find the relationship between the awareness of the agricultural employees working in the agricultural divisions in Nineveh Governorate and each of the following independent variables, namely (educational level, gender, current housing, academic specialization and training courses in the field of pesticide use) and according to the following law (Juda (2009).

1. Spearman Brown's equation: used to correct the stability of the scales calculated by half-segmentation method according to the following equation: (Quality, 2008: 241).

Results and Discussion

The First Goal

To identify the level of awareness of agricultural employees working in the agricultural divisions of the Nineveh Governorate Agriculture Directorate of the negative effects on the use of pesticides in general:

The results of the research showed that the highest value (actual answer) obtained by agricultural employees in the agricultural divisions in Nineveh governorate with negative effects on the use of pesticides is (271) numerical values, and the lowest numerical value is (73) and an average of (155) numerical values. Three categories according to their awareness of the negative effects of the negative use of pesticides were shown in Table (1).

Table 1 : The Distribution of respondents into categories according to their awareness of the negative effects of the adverse use of pesticides in general.

Numeric categories	The number	Percentage%	The Mean
73-138	42	33.6	116.54
139-205	70	56	163.39
273-206	13	10.4	236.38
Total	125	100	

Table (1) shows that the highest percentage of agricultural employees working in the agricultural divisions was in the middle category (139-205), as it constituted 56%, and that 33.6 was in the low category (73-138), while the high category was (206-273) with a ratio of 10.4%, and this indicates that the awareness of agricultural employees working in the agricultural divisions in Nineveh governorate of the negative effects of using pesticides was moderate due to the lack of information and knowledge of agricultural employees about the use of pesticides relating to their lack of knowledge of the negative and positive aspects resulting from the use of pesticides and this is because of their lack of training sessions on the subject, whether inside or outside the governorate or outside the country.

The fourth goal:

Identifying the correlation between the awareness of agricultural employees and the independent variables (age, educational level, gender, housing, number of years of service for the agricultural employee, agricultural specialization and training courses in the field of pesticides).

Age: The results of the research showed that the highest age of the respondents was (63) years and the lowest age was (25) with an average of (41) years. The respondents were divided according to their ages into three age grouping the range and length of the category.

Table 2 : Distribution of respondents into categories according to the age variable and its relationship to the level of awareness of agricultural employees of the agricultural people of the negative effects of using pesticides.

Categories	Number	Percentages	Mean	Value of Pearson's Simple Correlation Coefficient of R
25-37	51	8 40.	32.62	– 0.071 Non-significant
38-50	61	48.8	42.83	
51-63	56.33	10.8	13	
The Total		%100	125	

It can be seen from Table (2) that the highest percentage of respondents was in the intermediate category (38-50), which amounted to (48.8%), while the low group from (25-37) was the lowest rate (40.8%), while the percentage of the high category was (10.8%). The results showed that there is no significant correlation between the agricultural employees awareness of the negative effects of the use of pesticides and the age variable. And age variable. The reason for this may be that the respondents who are agricultural employees working in the agricultural divisions in the field of pesticides have a rush and desire to work as a result of their activities with employees who are not specialized in pesticide guidance and that age has nothing to do with the awareness of the agricultural employee:

2-The Educational level :

The respondents were distributed, depending on the educational level variable, into (6) categories as shown in Table (3):

Table 3 : Distribution of respondents into groups according to the educational level variable and its relationship to the level of awareness of agricultural employees working in the agricultural divisions about the negative effects of pesticides.

Value of Spearman's Coefficient of Correlation	Percentages	Number	Educational Level categories
* 0.180 Significant	27	27	Graduate of Agricultural Prep
	17	17	Agricultural institute graduate
	66	66	Graduate of the College of Agriculture and Forestry
	1	1	Higher Diploma in Agricultural Sciences
	14	14	Master of Agricultural Sciences
	0	0	PhD in Agricultural Sciences

Table (3) shows that the vast majority of respondents hold a bachelor's degree, as their percentage reached (66%), and that (27%) are holders of the Agricultural Preparatory Certificate, and that the percentage of graduates from the Agricultural Institute reached (17%). The results showed a significant correlation between the level of awareness of agricultural employees on the negative effects of pesticides and the educational level, as the value of the treatment of spurman correlation ((* 0.180) It is a significant level (0.05), thus rejecting the null hypothesis and accepting the alternative hypothesis which states that there is a significant correlation between the awareness of agricultural employees working in the agricultural divisions about the safe use of pesticides and the educational level. The reason for this may be that the higher the academic achievement of the agricultural employee, the greater his awareness of the use of pesticides, as a result of the information and knowledge he acquired through participating in agricultural activities, training and educational sessions in the field of pesticide use in pesticide related topics, and this is considered a logical result.

3. Gender:

The respondents were classified according to the gender variable into (males and females), as shown in Table (4).

Table 4 : Distribution of respondents into categories according to the gender variable and its relationship to their level of awareness of the negative effects of pesticides

Value of Spearman's Rs	Percentages %	Number	Specialty Categories
-0.093 Not- significant	110	110	Male
	15	15	Female
	100%	125	Total

The results of Table (4) shows that the highest percentage of respondents is the percentage of males, reaching (110) respondents, while the percentage of females is (15%), and the results showed that there is no significant relationship between the level of awareness of agricultural employees about the negative effects of pesticides and gender As the value of the spurman correlation coefficient reached (0.093), which is a non-significant value, thus accepting the null hypothesis that states (there is no significant correlation between the level of awareness of agricultural employees in the use of pesticides and the gender variable). This indicates that there is no significant correlation between the level of awareness of agricultural employees and gender. This means that the difference in the sex of agricultural employees does not affect their level of awareness in the use of pesticides.

4. Housing:

Researchers were distributed according to housing into two categories (rural and urban), as shown in Table (5).

Table 5 : Distribution of respondents according to the housing variable into categories and its relationship to the level of awareness of agricultural employees working in the agricultural divisions about the negative effects of pesticides.

Specialization Categories	Number	Percentages %	The value of Spearman's coefficient of correlation rs
Rural	56	56	-0.128 Not - Significant
Urban	69	96	
Total	125	100%	

It is evident from Table (5) that the respondents of rural and urban respondents recorded the percentages (56%) and (69%) respectively. The results showed that there was no significant correlation between the agricultural employees' awareness of the negative effects of pesticides, as the value of the Spearman's Coefficient of Correlation was rs (-0.128), which is a relationship that accepts the null hypothesis (there is no significant correlation relationship between employee awareness and housing). The reason for this may be that awareness does not depend on the area of residence of the respondents, but rather on other factors that may relate to the characteristics of the agricultural employees.

5. The Number of the Years of Service:

The results of the research showed that the longest service period for the respondents in the agricultural departments was (37) years and the lowest service was (2) years, with an average of (15) years. The respondents were divided into three categories of the number of years of service as shown in table (6).

Table 6 : The Distribution of respondents according to the variable number of years of service in agricultural departments into categories and its relationship to their level of awareness of the negative effects of using pesticides.

Categories	Number	Percentages %	Mean	The Value of Pearson's Simple Correlation Coefficient of Rs
2-13	63	50.8	7.86	0.093 Not- Significant
14-25	55	44	19.06	
26-37	7	5.6	31.71	
Total	125	100%		

Table (6) exemplifies that the highest percentage of respondents was recorded by the low category (2-13 years), as it reached (50.8%), followed by the percentage of respondents in the intermediate category of (14-25) years, which reached (44%). The high category (26-37) years recorded the percentage reached (5.6%)The results showed that there is no correlation between the level of awareness of agricultural employees on the negative effects of pesticides and the variable of the years of service in agricultural departments, as the value of the simple correlation coefficient of Pearson Rs (0.093) which is not significant, and thus accept the null hypothesis which states that there is no correlation relationship between the awareness of agricultural employees and the number of years of service. This shows that the number of years of service that an agricultural employee spends in agricultural departments has no relationship to the mentioned level.

6- Agricultural Specialization:

The respondents were distributed according to the specialization into two categories specializing in agricultural extension and not specialized, the total number of respondents specialized in agricultural extension reached (23) respondents and that of non-specialists was (102) respondents.

Table 7 : The Distribution of the Respondents into Categories According to the Variable of Agricultural Specialization and Its Relationship to the Awareness of Agricultural Employees Working in the Agricultural Divisions about the Negative Effects of Pesticides.

Specialty Categories	Number	Percentages %	Value of Spearman's Rs
Specialist in agricultural extension	23	23	* -0.218 Not-Significant
Not specialized in agricultural extension	102	102	
Total	125	100%	

The results of Table (7) showed that the percentage of respondents specialized in the field of agricultural extension was (23%), while the percentage of the non-specialized ones in the field of agricultural extension reached (102%) , which means that the majority of the respondents working in the agricultural sector from different agricultural specialties and a small group of them specialized in the field of agricultural

extension, and the reason behind this may be due to the fact that the agricultural institutions have been forced to hire non-specialists ones in the field of pesticides.

7. Training Sessions in the Field of Pesticide Use:

Table 8 : The Distribution of Respondents According to the Variable of participation in previous training sessions and its relationship to the level of the agricultural employees awareness about of the negative effects of using pesticides.

Training Sessions	Number	Percentages %	The value of Spearman's Rs
One session	111	111	0.039 Not- Significant
Two Sessions	5	5	
Three Sessions	9	9	
Total	125	100%	

Table (8) results show that the percentage of respondents who received one training session about pesticides and their uses was (5%), while the percentage of respondents who participated in two training sessions about pesticides was (9%), and for the group of respondents who did not participate in the training sessions related to pesticides has reached (111%) and it is evident from these results that there is no significant correlation between the awareness of agricultural employees in the wrong use of pesticides and the variable of training courses in the field of pesticides use. Spearman's Coefficient Correlation which was (0.039) which was not-significant. This texemplifies that there is no significant correlation between the awareness of agricultural employees in using pesticides and the variable of training sessions in the use of pesticides.

Conclusion

Found Based on the research results, the following recommendation were1. The awareness of the agricultural employees and workers in the agricultural employees in Nineveh Governorate in general was moderate. It is clear that workers in the agricultural divisions have both the information and awareness in a way that enables them to safely use pesticides through their visits to agricultural fields and their mixing with farmers.

It is also concluded that the agricultural employees working in the agricultural divisions in Nineveh Governorate have high awareness that is affected about eating unwashable fruits and vegetables sprayed with pesticides as a result of previous information and experiences they gained from training sessions and conferences on the topic. Is concluded that the agricultural employees working in the agricultural departments lack the awareness regarding spraying pesticides with agricultural aircraft and air pollution, which is a natural result of not using agricultural aircraft in the process of spraying pesticides, at least in the research area in Nineveh Governorate. It is concluded that the following changes (educational level and agricultural specialization have a high role in developing awareness for agricultural employees in the field of safe and proper use of pesticides, while the independent variables (age, educational level, gender, housing, number of years of service for the agricultural employees, agricultural specialization and training sessions in the field of pesticides) have no effect on developing the level of awareness of agricultural employees working in the agricultural divisions regarding the use of pesticides.

Recommendations

1. Increasing the awareness of employees working in the agricultural divisions in Nineveh governorate in the fields of pesticide use in general.
2. The agricultural divisions and directorate must be responsible for developing the level of knowledge of agricultural employees working in the agricultural divisions in Nineveh Governorate by encouraging them to join training and development sessions inside or outside the country to raise their level of awareness of the negative effects of the use of pesticides.

References

Al-Azzawi, N.K. (1999). Needs of the Cognitive Extension Beekeepers in Baghdad Governorate, Master Thesis, College of Agriculture, University of Baghdad.

Al-Daodi, Salah Jassim Amin Suleiman, (2003). Farmers Educational and training requirements in Tamim Governorate in the field of using and maintenance of pivotal sprinkler irrigation systems and their relationship to some factors, a Master Thesis, Department of Agricultural Extension, College of Agriculture and Forestry, University of Mosul.

Al-Janabi. (Arab Organization for Agricultural Development, 2007: 4.

Al-Jubouri, Isra Muhammad Awaid, (2006). Determining the Agricultural and Domestic Extension Needs of Rural Women and the Requirements to Meet them from her Point of View in Baghdad Governorate, Master Thesis, College of Agriculture, University of Baghdad.

Al-Jubouri, K.A. (2006). The Rate of Yellow Corn Farmers Adoption of Modern Technologies in the Hawija District and Their Relationship to some Factors, Master Thesis, College of Agriculture, University of Mosul.

Al-Maamouri, S.H.M. (2002). The effect of each of the two methods of the extension seminar and the demonstration of the method and its follow-up in developing the knowledge and skill of sheep breeders in the field of benefiting from Al-WissamahVillage, PhD thesis, College of Agriculture, University of Baghdad.

Al-Otaibi, S.B.M. (2005). The essence of employee empowerment: a conceptual framework, a paper submitted to the Tenth Annual Forum for Total Quality Management, King Saud University, College of Administrative Sciences, 1-42.

Al-Sabbagh, Dhafer (M.), (1998). The Role of Agricultural Extension in Agricultural and Rural Development11. Khoury, Essam and Adnan Suleiman (2004). Economic Development a Study of Improvement and Retardation.

Al-Talib, Ahmed AwadTalib Ali, (2005). THE Level of Knowledge of Agricultural Farmers. Al-Sharqat/Salah El-Din in the fields of Using Agricultural Pesticides Masmaster Thesis, of A, Department of Agricultural Extension, College of Agriculture and Forestry, University of Mosul.

Arab Organization for Agricultural Development (1997). The role of agricultural extension in transferring research results to farmers and its impact on sustainable development, National Symposium on Enhancing the Role of Agricultural Extension in Sustainable Development, Khartoum, August

Fathallah, Ali Taj Al-Din - (2000). Pesticide equipment and their uses-Department of Scientific Publishing and Printing Press – Riyadh.

Fawy, Sahar, Khaled Abdel-Hadi and Mamdouh Jibril (2000): A Safe Use of Pesticides, The Agricultural Journal, No. 497, Year 42, Dar Al-Taawon Institution for Printing and Publishing, Cairo.

Hassan, M.R. (2007). The Importance of Agricultural Extension in Protecting the Environment, Iraqi Journal of Agriculture, Issue 3, Ministry of Agriculture, Baghdad.4. Saleh, Sabri Mustafa, Al-Tanoubi, Muhammad Omar and Azmy, Suheir Muhammad (2004). Agricultural Extension, Basics and Applications, First Edition, Alexandria Book Center, Faculty of Agriculture, Alexandria University.

Hassan, M.S. (2004). The Alternatives to the use of pesticides in protected agriculture, Iraqi Journal of Agriculture, Issue 2, Ministry of Agriculture, Baghdad.

Judeh, Mahfoudh Ahmed (2009). Basic Statistical Analysis Using SPSS, Second Edition, Wael Publishing House, Amman, Jordan.

Meyerer, Patrick (2001). "The Safe and Effective Use of Pesticides", translated by Walid Kaake, United Arab Emirates University.

The Arab Organization for Agricultural Development (2001). The current situation of unused accumulated agricultural chemical pesticides in the Arab world, appropriate methods for the safe disposal of unused agricultural pesticides in the Arab world, Khartoum, October.

The Arab Organization for Agricultural Development, (1995). A Study of the possibility of Arab cooperation in the field of integrated control of the most important agricultural pests in the Arab world, Al- Khartoum, Sudan, June.

The Arab Organization for Agricultural Development, (1995). Pesticide Legislation and Control, the National Symposium on Agricultural Pesticides and the potential for avoiding their dangers in the Arab world, Abu Dhabi, United Arab Emirates, December.

The Arab Organization for Agricultural Development, (2001). The current status of accumulated agricultural chemical pesticides not used in the Arab world, the appropriate methods for the safe disposal of agricultural pesticides unused in the Arab world, Al- Khartoum, October.

The Food and Agriculture Organization of the United Nations (FAO) (2000), Agricultural Pests and Bases for Their Control, Iraq, Agricultural Program for Security Council Resolution, (1986), Training Course Curriculum for Plant Protection in Erbil-Duhok-Sulaymaniyah Governorates.