Knowledge of farmers by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests in Al-Mahawil region, Babylon province and their relationship to some variables

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ABSTRACT

The research aims to identify the level of wheat farmers' knowledge by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests in Al-Mahawil region for the agricultural season (2017/2018), in addition to determining the relationship between the level of farmers' knowledge with these recommendations and some independent variables (the cultivated area with wheat, the contribution of wheat cultivation to Annual income, educational level, agricultural experience). To achieve the research goal, a scale of 31 paragraphs divided into six axes was prepared. Data were collected from a random sample of 60 farmers in the Al-Mahawil region, by means of a questionnaire using the interview method. The research concluded that 76.67% of the respondents described their level of knowledge by these recommendations as weak and a medium (40.34 degrees). As well as, there is a significant relationship between the knowledge level of farmers and the independent variables (the cultivated area with wheat, the contribution of wheat cultivation to Annual income, educational level, agricultural experience). The research reached conclusions: The weak level of knowledge of farmers in the Al-Mahawil region by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests. The researcher recommended several recommendations, including The General Authority for Agricultural Extension and all its foundations in the agricultural directorates and agricultural divisions, shall undertake the task of disseminating knowledge and expertise related to agricultural scientific recommendations for using chemical pesticides among wheat farmers.

Keywords: agricultural scientific recommendations, chemical pesticides, controlling wheat pest, variables.

معرفة المزارعين بالتوصيات العلمية الزراعية لاستخدام المبيدات الكيميائية في مكافحة آفات الحنطة في منطقة المحاويل/محافظة بابل وعلاقتها ببعض المتغيرات

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الملخص

يهدف البحث إلى التعرف على مستوى معرفة مزارعي الحنطة بالتوصيات العلمية الزراعية لاستخدام المبيدات الكيميائية في مكافحة آفات الحنطة في منطقة المحاويل للموسم الزراعي 2018/2017 ، بالإضافة إلى تحديد العلاقة بين مستوى معرفة المزارعين بتلك التوصيات وبعض العوامل المستقلة (المساحة المزروعة بالحنطة ، مساهمة زراعة الحنطة بالدخل السنوي ، المستوى التعليمي ، الخبرة الزراعية). وتحقيقاً لهدف البحث أعد مقياس تكون من 31 فقرة موزعة على ست محاور. وجمعت البيانات من عينة عشوائية مقدارها 60 مزارعاً في منطقة المحاويل بواسطة استبانة بطريقة المقابلة. وخلص البحث إلى إن 76.67%من المبحوثين يوصف مستوى معرفتهم بتلك التوصيات بالضعيف وبمتوسط 40.34 درجة ، وكذلك وجود علاقة معنوية بين المستوى المعرفي للمزارعين وكل من العوامل المستقلة (المساحة المزروعة بالحنطة ، مساهمة زراعة الحنطة بالدخل السنوي ، المستوى التعليمي ، الخبرة الزراعية). وتوصل البحث إلى استنتاجات منها : ضعف المستوى المعرفي للمزارعين المبحوثين في منطقة المحاويل بالتوصيات العلمية الزراعية لاستخدام المبيدات الكيميائية الزراعية في مكافحة آفات الحنطة. واوصى الباحث بتوصيات عدة منها: إن تقوم الهيئة العامة للإرشاد الزراعي وجميع تشكيلاتها في مديريات الزراعة والشعب الزراعية بمهمة نشر المعارف والخبرات الخاصة بالتوصيات العلمية الزراعية لاستخدام المبيدات الكيميائية بين مزارعي الحنطة.

كلمات مفتاحية : التوصيات العلمية الزراعية ، المبيدات الكيميائية ، مكافحة آفات الحنطة ، المتغيرات.

1. INTRODUCTION

Wheat is considered at the forefront of global strategic crops for its importance, it is a food source for more than 35% of the world's population. It is one of the most important grain crops, it covers the largest cultivated area on the surface of the earth compared to other food crops, and wheat bread contains proteins (12-17%) and starches (76-78%) and fats (1.2-1.5%) (23). Wheat is considered the first strategic crop in Iraq, where the cultivated area with the crop amounts to 3,154,000 dunum, with a production rate of 2,178,000 tons (6). Despite this, Iraq is facing, especially since more than three decades ago, a large deficit in the production of the crop, which annually has to import millions of tons to fill the deficit in the production of the crop, which costs millions of dollars annually. For example, Iraq needs 3250000 tons of wheat grains to feed its population and imports more than two million tons annually, equivalent to (60-70%) of its actual need, which represents a heavy burden on the state's general budget (7, 20). Insufficient national production of wheat represents fragile food security (27). The aforementioned deficit is due to many reasons, the foremost of which is low agricultural productivity, and the Ministry of Agriculture has considered low agricultural productivity, one of the most important challenges facing the agricultural sector in Iraq (28). The average wheat production in Iraq is (690 kg/dunum) (6), while the average wheat production in Egypt is (2447 kg/dunum), in Saudi Arabia (1874 kg/dunum), and in Morocco (2016 kg/dunum) (24). The productivity per unit area of wheat in Iraq is low compared to global production or developed countries, where the gap between consumption and production appears large although this country is one of the main citizens for the emergence of this crop. The low productivity of wheat crop is due to several reasons, the most important of which are: lack of good care in soil and crop service operations and lack of adopting modern technologies in the field of crop service, including the selection of good and appropriate varieties for the agricultural region and the failure to follow a balanced fertilization system (8), in addition to the exposure of this crop to different pests (insects, diseases, weeds). The global losses resulting from pests are estimated to be in the range of (30-40%) before harvest and (10-20%) after harvesting, taking into consideration the quality of the pests, the percentage of insect pest damage is 14%, plant diseases 13% and weeds 13%. These rate percentages hide important differences, where we find that losses in crops in developing countries where agriculture is one of the basic components for the national economy are much higher than in developed countries (12). In Iraq, infection with some pests causes an economic loss to reach 90%, As in the case of infestation with Sunn insect on wheat and barley (11). Numerous studies have unanimously agreed that the amount of losses caused by weeds in agricultural lands constitutes (34%) of the total losses that may occur in the agricultural sector in general, which include soil losses, diseases, insects and livestock losses (5). Scientific research indicates that the spread of many and varied weeds in the fields of wheat and barley causes a loss in the productive yield estimated by (40-50%) and a deterioration in the quality as well as the high costs of controlling operations, according to the density and quality of the weeds (14, 29). The latest studies indicate that without direct human intervention to control pests, losses could reach 70% and $ 525,000 million annually, which reduces global food supplies and increases cases of malnutrition significantly, thus reducing losses in agricultural production as a result of various pests will ensure the efficiency of increasing agricultural productivity (13). Therefore, researchers worked on controlling various pests in a variety of ways, including the use of chemical pesticides for ease of use and rapid impact, and they have achieved impressive results in eliminating them, reducing their damages, reducing the losses resulting from them, and increasing crop production (15). Chemical pesticides are considered one of the agricultural technologies, and the pesticide is defined as any material or mixture of substances intended to protect crops from

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infection by agricultural pests and treating the infection they cause (16), where these pests cause significant losses in agricultural production, which is estimated by one of the studies of the Food and Agriculture Organization (FAO) between (40 - 50)% of total production in the Arab world, including Iraq (21). Recently, the Food and Agriculture Organization of the United Nations (FAO) warned in its annual report in 2006 that the technologies used in dealing with pesticides in most developing countries are old, belonging to 40 years ago. The organization invited to the adoption of minimum sound and effective standards for using chemical pesticides in agriculture by using modern equipment and providing the best possible training for farmers (16). The wrong uses of pesticides by farmers as a result of their ignorance of the scientific recommendations regarding pesticides, make those pesticides turn into a harmful tool, when used in higher doses than recommended doses, causing danger to humans, animals, plants and all components of the ecosystem (31). Publishing researches and learning farmers on the correct methods of using pesticides rests with the Agricultural Extension Authority, and since pesticides are agricultural technology, therefore the Agricultural Extension Authority must educate farmers about the dangers of using chemical pesticides on crops and vegetables, so knowing farmers how to deal with pesticides leads to the proper and safe applying for them and achieving the desired goals of using it as a technology that contributes to protecting crops and helping in increasing agricultural productivity and production (30). Al-Mahawil region is one of the agricultural regions in Babylon province, and wheat cultivation is widespread in it, where the area cultivated with wheat is estimated to be approximately 12240 dunums, and it faces problems of low productivity of the crop estimated by 800 kg/dunum (33). It is part of the state of low productivity in Iraq. The persistence of low productivity of wheat in Al-Mahawil region raises many questions, including:

1- What is the level of farmers' knowledge by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests in Al-Mahawil region?
2- What is the correlation between the knowledge level of wheat farmers with agricultural scientific recommendations for using chemical pesticides and some independent variables that are directly related to the level of their knowledge, which are: (the cultivated area with wheat, the contribution of wheat cultivation to Annual income, educational level, agricultural experience)?

The objective of Research

1- Knowing the level of farmers' knowledge by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests in Al-Mahawil region.
2- Determining the correlation between the knowledge level of wheat farmers with agricultural scientific recommendations for using chemical pesticides and some independent variables that are directly related to the level of their knowledge, which are: (the cultivated area with wheat, the contribution of wheat cultivation to Annual income, educational level, agricultural experience).

Hypotheses of research

There is a correlation between the knowledge level of farmers with the scientific recommendations for using chemical pesticides and each of the following independent variables:

1- The area cultivated with wheat.
2- The contribution of wheat cultivation to the annual income.
3- The educational level of farmers.
4- Agricultural experience for farmers (number of years of wheat cultivation practice).

2. MATERIALS AND METHODS

The research comes within the framework of diagnostic research that falls within the descriptive approach, where this approach is

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appropriate in arriving at detailed data and facts about the needs of individuals at a particular time (1). The research included all 583 wheat farmers in Al-Mahawil region for the agricultural season 2017/2018 (33). A random, proportional, stratified sample was taken from the farmers' community, 10% in each region, and with a rate of 60 wheat farmers as shown in Table (1).

Table 1: Number of wheat farmers and the sample size distributed among the districts in Al-Mahawil region.

No.	Districts	Number of farmers	Number of individuals sample
1	AL-musayyab bideat	116	12
2	AL-Findia	100	10
3	AL-Katonia	80	8
4	Abo Sdera	62	7
5	AL-Shetia	93	9
6	AL-Saeedia	62	7
7	AL-Badie AL-kabeer	70	7
Total		**583**	**60**

Preparing and developing the scale

To achieve the research objectives, a questionnaire has been prepared, and it is one of the means of gathering information from the respondents, which includes a set of questions that are required to be answered by the respondents. It was prepared in the light of the scientific literature and guidance Bulletins on the subject of plant protection and the opinions of specialists on the subject of controlling wheat weeds, where the test consisting of one correct alternative test paragraph was identified from a group of alternatives, the scale of knowledge for wheat farmers by scientific agricultural recommendations for controlling has been divided into six axes as follows: description of the appropriate pesticide, preparation of controlling requirements, preventive procedures before controlling, preventive procedures when Controlling, preventive procedures after control, damage or risks of using pesticides. Each axis was identified by a number of paragraphs, where the scale included, in its initial form (31 paragraphs) which distributed across six axes as shown in a table (2).

Table 2: Distribution of suggested axes and paragraphs for the farmers' knowledge level by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests.

No.	Knowledge Axes	Numbers of Paragraphs	Ranges of values	Percentage (%)
1	Description of the appropriate pesticide for pest	1. Using the appropriate pesticide 1-2	2 — 1	12.90
		2. The description of the pesticide 3-1	3 — 1	
		3. Quality of the used pesticide 1-3	1 — 3	
		4. The efficiency of used pesticide 1-2	1— 2	
2	supplying requirements for controlling	1. The person who controlling 1-3	1 — 3	9.68
		2. Using requirements of controlling 1-2	1 —2	
		3. Using equipment and tools of controlling 1-2	1— 2	
3	Preventive Procedures before controlling	1. Irrigation before controlling 1-2	1 — 2	16.13
		2. The state of the soil 1-2	1 — 2	
		3. Maintaining the equipments and	1 — 2	

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		tools of controlling 1-2		
		4. Take into account climatic conditions 1-2	1 — 2	
		5. The amount of pesticide used 1-2	1 — 2	
4	Preventive Procedures at controlling	1. Quality of the used pesticide 1-2	1 — 2	16.13
		2. The dose of the used pesticide 1-2	1 — 2	
		3. Controlling method 1-2	1 — 2	
		4. The appropriate date for combating 1-3	1 — 3	
		5. Standardization and setting the equipment and tools of controlling 1-2	1 — 2	
5	Preventive Procedures after controlling	1. Washing hands, body and work clothes 1-2	1 —2	22.58
		2. Washing equipment and tools of controlling 1-2	1 —2	
		3. Disposing of empty packages 1-3	1 — 3	
		4. Disposing gloves and masks 1-3	1 — 3	
		5. Protection of farm animals 1-2	1 — 2	
		6. protection of Food and drinking water 1-2	1 — 2	
		7. Irrigation after controlling 1-2	1 —2	
6	Damages or risks of using pesticides	1. Risks on the workers in controlling 1-2	1 —2	22.58
		2. Risks on livestock and bees 1-2	1 — 2	
		3. Risks on the cultivated crops 1-2	1 — 2	
		4. Risks on the environment (water, air, and soil) 1-2	1 — 2	
		5. Risks on product crop 1-2	1 — 2	
		6. Risks on the subsequent crop 1-2	1 — 2	
		7. Risks on Natural enemies 1-2	1 — 2	
Total		**31 Paragraphs**	**31 – 68**	**100**

The validity of the scale

To verify the Scale's Validity, the questionnaire was presented in its preliminary form to a group of 4 experts in agricultural extension to know the Face validity for the questionnaire (which measures what was set to measure it, mean the extent to which the scale has achieved the goal for which it was designed). As for the Content Validity, it means the extent to which the scale components represent the aspects of the measured aspect, mean the extent to which the set objectives are covered (3). It was accomplished by presenting it to the 6 experts in plant protection to demonstrate their agreement with the dimensions and paragraphs of the scale for using them in the research. Weight (numerical value) was determined for each phrase in the approval scale of experts and as follows (3 degrees for the approval statement, 2 degrees for the approval statement with the modifications, 1 degree for the non-approval statement). A cut threshold of 85% from the top grade has been set for the approval scale of experts to keep the questionnaire axes and paragraphs in their final form, and all questionnaire paragraphs have achieved cut threshold and more (paragraphs 89%, and axes 100%), so all paragraphs and axes remained in the questionnaire form, according to opinions Questionnaire experts, The tool (questionnaire paragraph) is honest if it gets a degree of 75% or more (25). After making some necessary

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adjustments in light of the observations of experts and specialists in controlling wheat pests, the questionnaire will be ready in its final form.

Reliability of scale

After a preliminary examination of the questionnaire was conducted on a sample of 10 wheat farmers in Al-Mahawil area, they were randomly selected from those whose names did not appear in the research sample. The Reliability of the scale was measured, which means that the scale gives close results if it is repeated on the same individuals after a period of time and in the same circumstances (25), The Person equation was used in the split-half method, and the reliability coefficient amounted to (0.68), and it was corrected using the Spearman-Brown equation, so the reliability coefficient amounted to (0.82). Thus, the mentioned reliability values indicate the consistency of the paragraphs for the scale in the questionnaire, which are considered scientifically acceptable, where the reliability coefficient is more acceptable as its value approaches 1 (18).

Statistical methods

Percentages, arithmetic mean, Frequency Distribution, simple correlation coefficient, standard deviation, and T-test were used to display and analyze results.

3. RESULTS AND DISCUSSION

First Objective: Knowledge of farmers by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests in Al-Mahawil region.

The highest numerical value for Knowledge of farmers by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests amounted to 49 degrees, and the lowest numerical value amounted to (39 degrees) on a knowledge scale of 31 paragraph, its numerical values ranged between (31-68) degrees, with an average of 41.12 degrees, and Standard deviation of 31.58. 76.67% of the respondents, the numerical values of their knowledge by these recommendations fall within the weak and medium level, with a mean (40.34 degrees), which is less than the mean value for the scale degrees of 49.5 degrees, and the lack of respondents describes the level of their knowledge by these recommendations as a good as shown in Table (3).

Table 3: Distribution of respondents according to the level of knowledge by agricultural scientific recommendations for using chemical pesticides in controlling wheat pests.

Level of Knowledge	Values of Range	Values of mean	Number of Farmers	Percentage (%)
Low	31 – 43	40.34	46	76.67
Medium	44 – 56	43.64	14	23.33
High	57 – 68	0	0	0
Total	31 – 68	41.12	60	100

It is concluded from Table (3) that most of the wheat farmers respondents described their level of scientific recommendations by using chemical pesticides in controlling as weak, and this result may be attributed to several reasons, including:

1- The absence or limited extension activities conducted for farmers in the research area on the subject of agricultural scientific recommendations for using chemical pesticides in the controlling wheat pests. Despite the existence of an agricultural extension unit in the Agricultural Division, the existence of the extension farm in Al-Mahawil, as well as the existence of research scientific centers affiliated to the Ministry of Agriculture, such as the station of the palm tree, Al-Mahawil horticulture Station, the Palm Mothers' Project, and the Orchards

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Development Project by Modern Methods, but the research area witnessed only one indicative activity during the years 2016-2018 in the research topic, and none of the respondents participated in any training activity in the mentioned topic (32).

2- The wheat farmers do not have sufficient knowledge independently of each step of the control process and the correct scientific use for agricultural chemical pesticides.
3- The poor interest of the respondents' farmers on the subject of applying scientific recommendations in using chemical pesticides in controlling wheat pests, thus the weakness of the guiding institutions concerned with this, and the weak level of their communication with those institutions, especially stations and research or extension centers, which are all located in Al-Mahawil region and this is another indication of Weak indicative activity.
4- Weakness or absence of follow-up from the concerned agricultural units in the Agricultural Division in particular and the agricultural departments in the research area in general for farmers' fields and farmers during their carrying out agricultural operations due to the lack of adequate transportation means and limited fieldwork requirements and the lack of specialized agricultural staff and others, thus, non-meeting the requirements of farmers from the knowledge and the skills needed to improve their field practices, and lack knowledge of the problems that farmers suffered fieldly in order to find solutions to them or address them at once. The second objective: to determine the correlation between the knowledge level of wheat farmers with the scientific agricultural recommendations for using chemical pesticides and the following independent variables:

Second Objective: determining the correlation between the knowledge level of wheat farmers by the scientific recommendations for using chemical pesticides and the following independent variables:

1- The area cultivated with wheat

It appeared that the highest numeric value for the cultivated area with wheat is 60 dunums, it falls within the category of 46 to 60 dunums, the lowest numerical value is 5 dunums, and it falls within the category from 1 to 15 dunums, with arithmetic mean of 22.14 and a standard deviation of 23.47. The respondents were divided into four categories as shown in Table (4).

Table 4: Distribution of respondents according to the correlation between the knowledge level of wheat farmers by the scientific recommendations for using chemical pesticides and the area cultivated with wheat.

Categories	Number of farmers	Average knowledge	percentage	Coefficient of Correlation = 0.84
1 — 15	25	10	41.67	
16 — 30	28	25.10	46.67	S.D = 23.47
31 — 45	2	37.5	3.33	
46 — 60	5	60	8.33	
Total	60	22.14	100	Calculated (t) Values = 11.78
Significant level 0.01				

It is concluded from Table (4) That the highest percentage of respondents was at the (16-30) category, with a percentage of 46.67%, and the lowest percentage of the respondents was at the (31-45) category, with a percentage of 3.33%. The highest mean for knowledge of respondents was at a category of (46-60) amounted to (60 degrees), and the

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lowest mean for knowledge of respondents was at a category (1-15) amounted to (10 degrees). This means that the knowledge level for the researchers in the field of using agricultural chemical pesticides is ascending with an increase in the cultivated area and to know the relationship between the area cultivated with wheat and the level of the researchers' knowledge by the agricultural scientific recommendations for using chemical pesticides. The simple correlation coefficient (Pearson) was used and its value was 0.84. It indicates a positive relationship between the two variables, to verify the significance of the relationship, a T-test was conducted which its calculated value amounted to (11.78), It is higher than the tabular value (t) amounted to (1.99) at the probability level of (0.01). Thus, it accepts the research hypothesis, which states that there is a significant relationship between the area cultivated by wheat and the knowledge level of respondents farmers with agricultural scientific recommendations for using chemical pesticides. This means that the knowledge level of farmers increases with the area cultivated by wheat. These results agree with (10, 26, 2, 9) in their study of the level of agricultural knowledge. where they found that there was a correlation between the cultivated area and the knowledge level for the respondents. This result may be attributed to the high economic returns resulting from the exploitation of large areas correctly, which encourages farmers to provide modern technologies in order to apply them in their agricultural fields, which leads to an increase in their level of knowledge.

2- The level of contribution of wheat cultivation in the annual agricultural income for farmers

It appeared that the largest number of respondents to the contribution of wheat cultivation in annual income amounted to (29), with a percentage of (48.33%), which falls within the category (contribution with a medium degree). The lowest number of respondents was 7, with a percentage of (11.67%) which falls within the category (contribution with a high degree), with arithmetic mean amounted to (43.27) and a standard deviation of (33.23). The respondents were divided into three categories as shown in Table (5).

Table 5: Distribution of respondents according to the correlation between the knowledge level of wheat farmers by the scientific recommendations for using chemical pesticides and the contribution of wheat cultivation in annual income.

Contribution Categories by Income	**Number of farmers**	**Average knowledge**	**percentage**	**Coefficient of Correlation = 0.61**
Low	24	15.67	40	
Medium	29	56.89	48.33	S.D = 33.23
High	7	81.42	11.67	
Total	60	43.27	100	
Significant level 0.01				Calculated (t) Values = 5.92

It is concluded from Table (5) that the highest mean for respondents' knowledge was at the (contribution with a high degree) category, with an amount of 81.42 degrees, and the lowest mean for respondents' knowledge was at the (contribution with a low degree) category, with an amount of 15.67 degrees. This means that the knowledge level for the researchers in the field of using agricultural chemical pesticides is ascending with an increase in the contribution of wheat cultivation in annual income and to know the relationship between the contribution of wheat and the level of the researchers' knowledge by the agricultural scientific recommendations for using chemical pesticides. The simple correlation coefficient (Pearson) was used and its value was 0.61. It indicates a positive relationship between the two variables, to verify the significance of the relationship, a T-test was conducted which its calculated value amounted to (5.92), It is

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higher than the tabular value (t) amounted to (1.99) at the probability level of (0.01). Thus, it accepts the research hypothesis, which states that there is a significant relationship between the contribution of wheat cultivation in annual income and the knowledge level of respondents farmers with agricultural scientific recommendations for using chemical pesticides. This means that the knowledge level of farmers increases with increasing the level of contribution of wheat cultivation in the annual agricultural income for farmers. These results agree with (2, 9) in their study of the level of agricultural knowledge. This result may be attributed to the high economic returns resulting from wheat cultivation, which encourages farmers to provide information and modern technologies related to agricultural scientific recommendations for using chemical pesticides in controlling in order to apply them in their agricultural fields, which leads to an increase in their level of knowledge.

3- The educational level of farmers

It appeared that the largest number for the educational level of farmers amounted to (16), with a percentage of (26.67%) for the Preparatory category and the lowest number for the educational level of farmers amounted to (5), with a percentage of (8.34%) for the college category, with arithmetic mean amounted to (67.28) and a standard deviation of (20.50). The respondents were divided into three categories as shown in Table (6).

Table 6: Distribution of respondents according to the correlation between the knowledge level of wheat farmers by the scientific recommendations for using chemical pesticides and the educational level of farmers.

Educational level	**Number of farmers**	**Average knowledge**	**percentage**	**Coefficient of Correlation = 0.45**
Illiterate	8	38.62	13.33	
Primary	11	54.09	18.33	S.D = 20.50
Intermediate	14	66.14	23.33	
Preparatory	16	78.31	26.67	
Institute	6	82.50	10	
College	5	91.80	8.34	
Total	60	67.28	100	
Significant level 0.01				**Calculated (t) Values = 3.84**

It is concluded from Table (6) that the highest mean for respondents' knowledge was at the (college educational level) category, with an amount of 91.80 degrees and the lowest mean for respondents' knowledge was at the (Illiterate educational level) category, with an amount of 38.62 degrees. This means that the knowledge level for the researchers in the field of using agricultural chemical pesticides is ascending with an increase in the educational level of farmers and to know the relationship between the educational level and the level of the researchers' knowledge by the agricultural scientific recommendations for using chemical pesticides. The simple correlation coefficient (Pearson) was used and its value was 0.45. It indicates a positive relationship between the two variables, to verify the significance of the relationship, a T-test was conducted which its calculated value amounted to (3.84), It is higher than the tabular value (t) amounted to (1.99) at the probability level of (0.01). Thus, it accepts the research hypothesis, which states that there is a significant relationship between the educational level and the knowledge level of respondents farmers with agricultural scientific recommendations for using chemical pesticides. This means that the knowledge level of farmers increases with increasing the educational level for farmers. These results agree with (22, 17, 19) in their study of the level of agricultural knowledge. The reason may be attributed whenever the greater educational opportunities, the knowledge level of farmers by scientific

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recommendations for using agricultural chemical pesticides increased in a manner commensurate with their mental abilities and scientific perceptions towards agricultural operations, agriculture from their point of view is not only crop management but rather the application of modern scientific methods for these processes.

4- Agricultural expertise (number of years in cultivating wheat crop)

It appeared that the largest numeric value for the agricultural experience of farmers amounted to (50 years) and the lowest numeric value for the agricultural experience of farmers amounted to (6), with arithmetic mean amounted to (29.17) and a standard deviation of (22.40). The respondents were divided into three levels as shown in Table (7).

Table 7: Distribution of respondents according to the correlation between the knowledge level of wheat farmers by the scientific recommendations for using chemical pesticides and the agricultural experience.

Agricultural experience	**Number of farmers**	**Average knowledge**	**percentage**	**Coefficient of Correlation = 0.40**
1-17	24	9.17	40	
18 -34	11	28.18	18.33	S.D = 22.40
35-51	25	48.80	41.67	
Total	60	29.17	100	
Significant level 0.01				Calculated (t) Values = 3.34

It is concluded from Table (7) That the highest percentage for respondents was at the (35-51) category, with a percentage of 41.67%, mean of knowledge amounted to (48.80 degrees), and the lowest percentage for the respondents was at the (18-34) category, with a percentage of 18.33%, mean of knowledge amounted to (28.18 degrees). This means that the knowledge level for the researchers in the field of using agricultural chemical pesticides is ascending with an increase in the agricultural experience and to know the relationship between the agricultural experience and the level of the researchers' knowledge by the agricultural scientific recommendations for using chemical pesticides. The simple correlation coefficient (Pearson) was used and its value was 0.40. It indicates a positive relationship between the two variables, to verify the significance of the relationship, a T-test was conducted which its calculated value amounted to (3.34), It is higher than the tabular value (t) amounted to (1.99) at the probability level of (0.01). This indicates the existence of a significant relationship between the two variables, thus it accepts the research hypothesis, which states that there is a significant relationship between the agricultural experience and the knowledge level of respondents farmers with agricultural scientific recommendations for using chemical pesticides. This means that the knowledge level of farmers increases with the number of years of agricultural experience. These results agree with (2, 10, 26) in their study of the level of agricultural knowledge. where they found that there was a correlation between the cultivated area and the knowledge level for the respondents. Perhaps this result explains that the use of modern technologies and keeping up with agricultural scientific development increases the information of farmers and increase their experience in this field.

CONCLUSIONS

1- The weakness of the knowledge level for respondents farmers investigated in the Al-Mahawil region by scientific recommendations for using agricultural chemical pesticides in controlling wheat pests.
2- The independent variables (the cultivated area with wheat, the

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contribution of wheat cultivation to Annual income, educational level, agricultural experience) are directly proportional to the knowledge level of farmers and they are considered among the variables that have a significant contribution to influencing the knowledge level of farmers.

RECOMMENDATIONS

1- The General Authority for Agricultural Extension and Cooperation and all of its foundations in the agricultural directorates and agricultural divisions shall undertake the task of disseminating knowledge and expertise related to agricultural scientific recommendations for using chemical pesticides among wheat farmers.
2- Intensifying the efforts of the Agricultural Extension Agency in the Directorate of Agricultural in Babylon in order to involve farmers with training courses on agricultural scientific recommendations for using agricultural chemical pesticides in controlling wheat pests.
3- The Agricultural Guidance Authority should focuses when establishing training courses and extension activities on the following independent variables (the cultivated area with wheat, the contribution of wheat cultivation to Annual income, educational level, agricultural experience) because it is one of the variables that have a significant contribution to influencing the knowledge level of wheat farmers.
4- An agricultural extension Authority should prepare efficient extension plans and programs to ensure the deployment of modern technologies among farmers, including the use of biological control instead of chemical control, because it is a contemporary global trend that contributes to maintaining a clean environment and getting rid of the negative effects for chemical pesticides and reducing the harm of agricultural pests Greatly.

REFERENCES

1. Al-Asadi, Saeed Jasim (2008). The ethics of scientific research in the humanities, education and social sciences, 2nd edition, Warth Cultural Foundation, Department of Studies and Research, Iraq.

2. Al-Badri, Ashwaq Abdel-Razzaq (2001). The knowledge level for grain farmers in the field of rodent control in Al-Mahmudiya district and its relationship to some factors, Journal of Arts College, University of Baghdad, No. 55, pp. 379 - 390.

3. Al-Badri, Ashwaq Abdel-Razzaq and Abdullah Hussein Al-Sheikhly (2011). The Knowledge Needs For Vegetables Farmer in Dropping Irrigation Area Of Middle Part of Iraq and its Relationship with some Factors, Kirkuk Journal of Agricultural Sciences, 2 (2): 145 162.

4. Al-Jubouri, Abdul Rahman Jasim Mohammed (2013). Trends of wheat cultivating towards technology without plowing in Nineveh and Kirkuk provinces and their relationship to some factors, higher diploma thesis, (unpublished), College of Agriculture, University of Baghdad, Iraq.

5. Al-Chalabi, Faeq Tawfik (2004). Weeds, its illiteracy and its damages, Iraqi Agricultural Journal of Guidance, 2: 15-16.

6. Central Organization for Statistics and Information Technology, Complete Statistical Package, Wheat and Barley Production Report for the year (2018), Iraq.

7. Al-Janabi, Hasan (2011). Iraq food first, Iraqi Agriculture Journal, 2: 3-4.

8. Hassan, Salem Abdel-Rahman and Hamed Elias Khidr (2012). Effect of three dates of sowing on three varieties of wheat (Triticum aestivum) on North of Iraq, Nineveh province, Tikrit University Journal for Agricultural Sciences, 12 (1): 96-102.

9. Hassan, Salah Fares and Ashwaq Abdel-Razzaq Al-Badri (2014). Determining Prioritization of the knowledge axes of vegetable farmers by agricultural scientific recommendations for chemical pesticides used in pest control, Iraqi Agriculture Journal, 19 (7): 179-185.

10. Hannouch, Laith Jaafar (2001). Knowledge level of marketing guidelines for those involved in marketing tomato crops in

 ISSN 2072-3875

the Najaf province, an MA, (unpublished), Department of Agricultural Extension, College of Agriculture, University of Baghdad, Iraq.

11. Radhi, Hamid Mohammed Jawad Al-Sheikh (2008). Pest control and its effects on increasing agricultural production, Iraqi Agricultural Guidance Journal, 4: 33-36.

12. Alrubeai, Hussein Fadel (2006). Integrated Pest Control Systems Justifications and Means, Iraqi Agricultural Guidance Journal, 3: 42-45.

13. Alrubeai, Hussein Fadel (2018). Economic, environmental and nutritional damage to agricultural pests, Iraqi Network for Date Palm, Iraqi - datepalms.net \

14. Al-Shatti, Raisan Kareem. (2008). Effect of amounts of irrigation and herbicides on growth and yield of bread wheat and water use efficiency. Journal of Agricultural Sciences, 39 (3): 37-54.

15. Saleh, Shaker Mahdi (2005). Testing the efficacy of pesticide 11 325 in controlling thin and broad-leaved weeds in wheat crops. Ministry of Agriculture, Pesticide Registration and Approval Yearbook, 3 (1): 64-71.

16. Al-Adil, Khaled Mohammed. (2006). Pesticides, basic concepts, and their role in the agricultural and health fields, 1st edition, Dar Al-Kutub for Printing and Publishing, University of Baghdad, p. (276).

17. Al-Atabi, Alaa Kazem Jbara and the example of Abdul Latif Salman (2011). Knowledge needs for vegetable growers in the field of organic fertilization in greenhouses in Al-Nu'maniyah District /Wasit province and its relationship with some variables, Iraqi Agriculture Journal, 20 (2): 163 176.

18. Allam, Salah El-Din Mahmood (2011). Educational Measurement and Evaluation in the Teaching Process, 4th floor, Al Masirah House for Publishing, Distribution and Printing, Amman, Jordan, p. (320).

19. Ali, Abdul Sattar Omar Othman. (2002). Attitudes of farmers of Al-Hawija, Al-Taameem Governorate towards the use of some modern agricultural technologies and their relationship to personal, social, economic and communication factors, Ph.D. thesis, (unpublished), College of Agriculture and Forestry, University of Mosul.

20. Al-Issawi, Amir Hamza, Rashid Khudair Al-Jubouri and Khudair Abbas Jadou (2014). Response of Seven cultivars of bread wheat (Triticuam aestivum) to salt stress, Al Furat Journal of Agricultural Sciences, 6 (2): 130-142.

21. Food and Agriculture Organization of the United Nations (2011). Conservation and Expansion, A Policymaker's Guide to Sustainable Intensification of Crop Production for Small Owners, Rome.

22. Karmasha, Khudair Abbas Hamid and Raad Muslim Ismail Al-Khazraji (2014). The attitudes of rice farmers towards the seedling process according to the Rice Intensification Package (SRI) in Al-Muthanna province and its relationship to some factors, Iraqi Agriculture Journal, 19 (7): 187-201.

23. Arab Organization for Agricultural Development (2014). Arab Agricultural Statistics Yearbook, Volume 34, Khartoum.

24. Arab Organization for Agricultural Development (2016). Arab Agricultural Statistics Yearbook, Volume 36, Khartoum.

25. Al-Najjar, Nabil Juma Saleh (2010). Measurement and evaluation, an applied perspective with Spss software applications, Dar Hamid Publishing and Printing, Oman, AR (350).

26. Al-Nuaimi, Hoda Shukr Mahmood (2001). Knowledge level of date palm breeders from the side effects of pesticides used in controlling Dubas Bug palm insect in Baghdad, Master Thesis, (unpublished), Department of Agricultural Extension and Education, College of Agriculture, University of Baghdad, Iraq.

27. Ministry of Planning (2009). National Development Plan 2010-2014, Part One, Plan Document, Baghdad, Iraq.

28. Ministry of Agriculture (2011). Ministry of Agriculture action plan for the years (2011-2014), Iraq.

29. Chart, S.T.,T.F. Peeper, and A. e. Stone. (2006). Italian ryegrass (Latium Multiform) management option in Winter in Oklahoma. Tech. 21(2) : 151 – 158.

30. Rogers, M. Everett. (2004). Diffusion of Innovation. 4Th edition, Free Press, New York.

 ISSN 2072-3875

31. Yassin, M. A., Moslem, M. A., El-Samawaty, A. M. A., AL-Shikh, M. S. (2013). Effectiveness of Allium Sativum in controlling Sorghum Grain Molding Fungi. J. Pure Appl. Microbial.: 7(1): 101 – 107.

32. Al-Mahawil Agriculture Division, Agricultural Extension Unit, Agricultural Season Records (2016-2018).

33. Al-Mahawil Agriculture Division, Planning and Follow-up Unit, Agricultural Season Records (2017 | 2018).

ISSN 2072-3875