

## THE KNOWLEDGE LEVEL OF BEEKEEPERS IN DIAGNOSING AND CONTROLLING BEE PESTS IN AL-MAHAWIL DISTRICT/ BABYLON PROVINCE AND ITS RELATIONSHIP TO SOME VARIABLES

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### **Abstract**

The study aimed to determine the level of beekeeper's knowledge of the pests that afflict bees and methods of treating them in the Al-Mahawil district in general and to determine the level of knowledge of the beekeeper in diagnosing and controlling bee pests in each field of research and arranging them according to the arithmetic mean, As well as finding the correlation relationship between the knowledge level of the beekeeper and the group of independent factors represented by (age, educational level, number of years of beekeeping, number of Beehive, the purpose of breeding, training in the field of bee protection, membership in beekeeping organizations, level of contact with information sources) and identifying the problems facing beekeepers in Al Mahawil district / Babylon province, and encounter the problems facing beekeepers in Al Mahawil district / Babylon province, The research included all beekeepers in the Al-Mahawil district, And their number (119) educators registered with the agricultural divisions of the Babylon Agriculture Directorate, namely (Al-Mahawil, Nile, Imam, Al-Mussaib Project) after excluding (30) educators as a survey sample for the initial test of the questionnaire from the research community and the community was studied by 100% to become the number of respondents for the final procedures of the research (89) Breeder, Data were collected through a questionnaire form prepared to measure the level of knowledge of beekeepers in diagnosing and controlling bee pests. The questionnaire included three parts. The first part relates to the personal characteristics of the breeders, and the second part includes (58) items to test the level of knowledge of the beekeeper in diagnosing and controlling bee pests distributed in two areas (enemies of bees, and diseases that affect bees). The third part included the problems faced by beekeepers in diagnosing and controlling bee pests in Al Mahawil District / Babylon province. A primality test was performed for the purpose of calculating the stability factor and validity. The half partition method was used where the stability factor was (0.85) and the validity factor was (0.92). After that, the data were collected, unpacked and classified, and then analyzed through the SPSS statistical analysis program and a number of statistical means (range, category length, percentage weight, Spearman Brown's correction factor, weighted average). The results of the research showed that (48.32%) of the respondents have a medium level of knowledge in the diagnosis and control of bee pests with an average knowledge of (27.79), followed by the low group by (34.83%) of the respondents with an average knowledge of (18.64). The results showed that the axis of brood diseases ranked last in the diagnosis and control of bee pests, while the red hornet axis ranked first in the diagnosis and control of bee pests. The results also showed that the correlation is inversely related between the cognitive level of beekeepers in diagnosing and controlling bee pests and age. While the results showed a positive significant correlation between the level of knowledge of beekeepers in diagnosing and controlling

bee pests and the following independent factors (academic achievement, number of years of beekeeping, the purpose of breeding, training in the field of bee protection, membership in beekeeping organizations, and information sources), The problem (the spread of disease and pests) and the problem (the lack of protection for the local product and the large number of imported honey) came first and second in relation to the problems faced by beekeepers, while the problem of (lack of government support) came in ranked last. The most important conclusions of the results, The researcher recommends intensifying extension efforts to raise the level of beekeepers knowledge in the research area regarding general beekeeping practices and focus on disease and pest infestation, and the need to work on establishing branches for beekeepers' associations in the various districts of the province , as well as the need to pay attention to practical guidance through the implementation of the extension beehive project, increasing extension activities on bee pests within the annual plans of the extension department in the Directorate of Agriculture and extension centers and using extension campaigns that require combating diseases (Nosema, Varroa, American and European foulbrood), The need to protect the local product and subjecting imported honey to quality control and control to maintain remunerative prices for beekeepers.

Keywords: beekeepers, honey production, bee pests

### **Introduction**

Beekeeping and honey production has been an important agricultural activity since ancient times. The ancient Greeks and Romans considered honey a gift from heaven and the food of the gods, and honey gives people wisdom and gives inspiration to poets and artists. The ancient man painted the bee on the walls of buildings, warehouses, pots and money, considering it a sacred insect .It was also inscribed on the coffins and cemeteries of the great people and on the walls of the pyramids in ancient Egypt, and the honey bee was considered a symbol of honesty, sincerity, courage and disregarding death (Crockavier, 2009, 8), Beekeeping has become of great importance in the agricultural field, not only for honey production but for its role in increasing agricultural production by up to 30%, as well as preserving wild species through the completion of the cross-pollination process of flowers

The role of bees is not limited to completing the pollination process of economic crops, but rather completes the pollination of wild plants that humans use for industrial and therapeutic purposes, in addition to the importance of their presence as part of a balanced ecosystem (Tariq, 2015, 37). Gilles Ratia (World Beekeeper Conference 2009) mentioned that if the bee gives one euro to the beekeeper in an area of 3 km<sup>2</sup> around the hive, in return it gives 15 euros to the farmer, tree planter and gardener ,In the United States, honey bees are the main pollinators for more than 130 varieties of crops and are responsible for adding 15 billion dollars annually to the income of the value of the crops they pollinate, according to the German (Helmholtz) Institute for Environmental Research. The environmental benefit of insects, according to scientists' estimates, amounted to about 150 billion euros in 2005, which is equivalent to about one-tenth of the total value of food products in the world (Al-Hasnawi, 2012: 61), Honey bees are exposed to a number of diseases and pests that may cause them to mortality from their father and some of these pests cause a lot of damage to bee colonies more than others, and beekeepers have to know the conditions that make

insects, pests and diseases capable of infecting bee colonies. (kdhlc, 2007: 190)? Sick bee colonies are weak and cannot defend themselves, so strong bee colonies take advantage of this and attack and steal their honey, which causes transmission of infection from sick and weak groups to strong ones, in addition to that disease is transmitted when bees come into contact during the harvesting of nectar or pollen from flowers or during the feeding of bees or while visiting contaminated water sources, if the beekeeper did not discover the disease early and did not take appropriate measures towards that, he may transfer the infection from the sick to the healthy colonies (Crockavier, 2009, 157), *Nosema* disease is considered the most harmful disease in the adult stage of insects and is caused by a single-celled parasite that belongs to under the kingdom of primates or precursors, which causes a decrease in honey production up to (40%) due to its intrusion on the digestive tract of bees, causing the destruction of colonies, especially in warm and humid countries. (Al-Sayegh et al., 2018: 7). the rate of infection varies from one country to another, so we find that it represents 2% of the number of sects in Italy, while it reaches 65% of the sects in Germany (Al-Ghamdi and Abd Al-Salam, 2017: 63). As for the severity of infection with *Nosema Syrana* before treatment in The Iraqi province for the years 2019 and 2020, according to the statistics of the Ministry of Agriculture / Plant Protection Department - Bee Division, as they are distributed as in Table (1)

**Table (1) shows the incidence of *Nosema Syrana* disease in the provinces of Iraq**

<b>2020</b>	<b>provinces</b>	<b>2019</b>	<b>provinces</b>
<b>50%</b>	<b>Baghdad Al-Karkh</b>	<b>65%</b>	<b>Baghdad Al-Karkh</b>
<b>22%</b>	<b>Salahuddin</b>	<b>57%</b>	<b>Salahuddin</b>
<b>11%</b>	<b>Anbar</b>	<b>50%</b>	<b>Anbar</b>
<b>33%</b>	<b>Babylon</b>	<b>67%</b>	<b>Babylon</b>
<b>20%</b>	<b>Najaf Ashraf</b>	<b>56%</b>	<b>Najaf Ashraf</b>
<b>36%</b>	<b>Diwaniyah</b>	<b>50%</b>	<b>Diwaniyah</b>
<b>13%</b>	<b>Basra</b>	<b>57%</b>	<b>Basra</b>

Among the dangerous pests is the Varroa mite, the destructive Varroa, or the vampire of bees, since its appearance it has caused great harm to the beekeeping profession and the work of beekeepers is more burdensome and almost no cell has been spared from it, and it is an external parasite that feeds on the blood of whole stages, as well as larvae and pupae, and causes great damage if its treatment is neglected and ends with the destruction of the apiary completely (Khanbash, 2004: 4), The female Varroa insect feeds on the adult bee hemolymph during its presence between the bee's abdominal rings or in the chest on males and workers, then moves to the hexagonal eyes shortly before closing them (Maarec Publication, 2005: 5) and it is classified within the list of strong infectious diseases and is subject to strict control in Western countries by veterinarians of the ministries concerned with health and it can spread to other sects and even to other apiaries through the phenomenon of loss or wandering, theft, and the activity of migrating or expelling bees (Al-Sayegh, 2015: 8) Infection of bees with Varroa parasites weakens bees, as well as less resistance to pesticides (Haubruge et al., 2006). Varroa also increases food

consumption of bee virgins by 25% (Coffey, 2007). As for the rate of infection with Varroa parasite before treatment in the Iraqi province for the years 2019 and 2020, according to the statistics of the Ministry of Agriculture / Plant Protection Department - Bee Department, it is distributed as in Table (2)

**Table (2) shows the percentage of infection with Varroa parasite in the Iraqi provinces**

2020	provinces	2019	provinces
5%	Baghdad Rusafa	1.7%	Baghdad Rusafa
4.5%	Nineveh	14.9%	Nineveh
1.9%	Salahuddin	3.3%	Salahuddin
7.1%	Babylon	2.25%	Babylon
1.3%	Dhi Qar	5.5%	Dhi Qar
1.5%	Maysan	5.5%	Maysan
2.5%	Basra	5%	Basra

Among the pests that play a major role in the degradation of colonies is the Merops bird, which is known to eat bees and a seasonal bird in spring and summer, and it causes damage to bees as it devours workers while in flight to collect nectar and queens during the pollination trip (Al-Lawati Wa Soha, 2011: 48), It causes severe damage to apiaries, as it gathers in large numbers on the electricity and telephone wires near the cells and prevents the exit of bees, and a single bird can capture 120 bees per day (Magdy and Abdel-Imam, 2016: 93). Beekeepers' knowledge in diagnosing and controlling bee pests is the main focus and starting point for changing the behavior of beekeepers, and it is the first stage of the decision-making process. As well as being essential in forming, crystallizing and guiding the behavior of educators because it is the motivation and determinant of his behavior, so it plays a constructive role in the individual's tendencies, due to, interests, emotions and beliefs (Al-Issawi, 2003: 60). Beekeeping is practiced by a wide range of farmers in Babylon province, where the number of beekeepers, according to the statistics of the Prevention Department in the Babylon Agriculture Directorate, reached (475) educators for the year 2019 who own 10611 hives. In the number of breeders in addition to the number of breeders, in 2014 the number of breeders in Babylon province reached (486) educators who own (11130) cells, while in 2015 the number of breeders became (467) educators who own (7924) cells, and this decrease affected the level of production and productivity .It is known that agricultural extension is an educational activity and processes that aim to bring about desired positive changes in the behavior of beekeepers, which will result in economic changes desirable for them as a result of increasing productivity of beekeepers, which will lead to improving their standard of living and their families, and therefore it plays a role in achieving the development of the human element through educational programs. Provided by beekeepers (Al-Samurai and Adnan, 1990: 16). Given the importance of breeders 'knowledge in diagnosing and controlling bee pests and their impact

on raising the productivity of the hive and increasing production, the research problem is to answer the following questions:

- 1- What is the level of knowledge of beekeepers about the pests that afflict bees and methods of treating them in Al Mahawil District / Babylon province?
- 2- What is the relationship of correlation between the cognitive level of the beekeeper and the following set of independent variables (age, educational level, number of years of beekeeping, membership in beekeeping organizations, level of contact with information sources)?
- 3- What is the size of the problems that face beekeepers in Al-Mahawil District / Babylon province?

### **research aims**

1 - Determining the level of knowledge of the beekeeper about the pests that affect bees and methods of treating them in Al Mahawil District / Babylon province.

2 - Determine the correlation relationship between the knowledge level of the beekeeper and the following group of independent factors (age, educational level, number of years of beekeeping, membership in beekeeping organizations, level of contact with information sources).

3 - Determining the size of the problems facing beekeepers in the district of Al-Mahawil / Babylon province.

### **Materials and Methods**

#### **Statistical assumptions**

1. There is no significant correlation between the cognitive level of the beekeeper in spending time in diagnosis and pest control and age.
2. There is no significant correlation between the cognitive level of the beekeeper in the elimination of pests in diagnosis and pest control and the educational level.
3. There is no significant correlation between the cognitive level of the beekeeper in spending time on the diagnosis and pest control and the number of years of beekeeping.
4. There is no significant correlation between the cognitive level of the beekeeper in the elimination of pests in diagnosis and pest control and the membership of beekeeping organizations.
5. There is no significant correlation between the cognitive level of the beekeeper in the elimination of pests in diagnosis and pest control and the level of contact with the information sources.

#### **Procedural definitions**

1. The level of knowledge: It is the information that a beekeeper possesses in diagnosing and controlling pests, and it is expressed through the degree that he obtains through his answers to the test prepared for this purpose of the study.
2. Pest: It is every living organism that causes harm to the beekeeper, whether it is birds, insects, or diseases.

3. Pest diagnosis: The methods used to identify the pest.
4. Pest control: It is the use of materials, whether natural or chemical, to affect the vital activities of pests by killing or expelling.

#### **Research Methodology :**

This research is considered one of the diagnostic research, where it used the descriptive approach in conducting the research to reach to uncover the reality and then classifying those data and facts, processing them and analyzing them carefully to extract their implications and reach comprehensive and accurate results and generalizations about the phenomenon in question (Al-Rashidi, 2002: 16).

#### **Search area**

The area for conducting the research was confined to the district of Al-Mahawil / Babylon province , which is located to the north of the province center, and it was chosen as an area to conduct the research because beekeeping represents one of the important agricultural activities in the district, due to the presence of a large number of beekeepers in it and the low productivity of the beehives.

#### **Community and sample research**

The research included all beekeepers in the Al-Mahawil district, who numbered (119), and who were registered with the agricultural divisions of the Al-Mahawil District, namely (Al-Mahawil, Nile, Imam, and Al-Mussaib project). (30) breeders were excluded as a survey sample for the initial test of the questionnaire from the research community and the community was studied by 100 So the number of respondents for the final procedures of the research is (89) educators, as shown in Table -3

**Table 3. Distribution of respondents according to the agricultural divisions in the district of Al-Mahawil**

<b>agricultural divisions</b>	<b>The number of breeders</b>
<b>Al-Mahawil</b>	<b>40</b>
<b>Imam</b>	<b>23</b>
<b>Nile</b>	<b>26</b>
<b>Al-Mussaib project</b>	<b>30 survey samples</b>
<b>Total</b>	<b>119</b>

#### **Preparing the questionnaire form:**

A questionnaire form was prepared to collect the data required for the research, consisting of three parts, as follows:

part One :

This part includes a number of questions related to independent variables related to beekeepers, namely (age, educational level, number of years of beekeeping, membership in beekeeping organizations, level of contact with information sources)

part two :

The initial outline of the questionnaire form was prepared after reviewing a number of scientific sources and previous studies, as well as polling the opinions of some specialists. As a result, (60) paragraphs were identified distributed into two areas and in light of the opinions of the experts, the total of the paragraphs of the questionnaire became (65) paragraphs distributed into two areas and (6) Axes as in Table. 4 .

**Table(4) The Domain , axes and paragraphs included in the questionnaire form**

Paragraphs numbers	axes	Domain	No.
22	Diseases that affect the Brood	Bee diseases	-1
13	Diseases that affect the adult insect		
16	Diseases of that affect the Brood and full insect		
5	Warwar bird	Bee enemies	-2
4	Red Hornet		
5	wax insect		
65	<b>Total</b>		

After the initial test was performed, (7) items were deleted due to the difficulty and strength of discrimination, and thus the final number of items on the knowledge level measure became (58) items.

**the third part :**

It includes the most important problems facing beekeepers in the research area after reviewing the relevant resources and conducting meetings with a number of breeders in the district of Al-Mahawil. The five-point Likert scale was used to know the extent of the problems facing beekeepers. The following alternatives (very large, large, medium, few, none) were placed in front of each problem to indicate the viewpoint of the respondents in each problem.

Educational level: It is measured according to the following levels: illiterate, reading and writing, elementary, intermediate, preparatory, institute, college, higher diploma. The numerical values are given (1, 2, 3, 4, 5, 6, 7, 8) respectively.

5 - The level of contact with information sources: This variable was measured by identifying (9) sources from which the respondent can obtain information about pests of bees and put in front of each of them the following alternatives (always, sometimes, rarely, I do not get)

Numeric values were given to these alternatives and according to the following order (4, 3, 2, 1). Thus, the level of access to information resources ranges between (9-36) degrees. Measuring the level of knowledge of beekeepers in diagnosing and controlling bee pests The level of knowledge of the beekeeper was measured by diagnosing and controlling bee pests through the respondent's response to the scale's (58) paragraphs, which are divided into six axes that fall into two domains.

The assigned score in the score distribution table was given for the correct answer and zero for the wrong answer. Thus, the values expressing the level of knowledge of the respondents in the field of diagnosis and control of bee pests are limited to (0 - 100).

Measuring the magnitude of the problems facing beekeepers:

(8) problems have been identified that the beekeeper faces, and each has five alternatives (very large, large, medium, few, none).

The following values were given to them (4, 3, 2, 1, and zero) respectively, and to determine the degree of size of problems facing the beekeeper, they were arranged in descending order according to the arithmetic mean of each problem.

#### **Statistical methods and methods**

The Statistical Package Social Science SPSS program was used and many statistical methods and methods that lead to achieving the research objectives such as (Range, paragraph difficulty factor, paragraph discrimination strength, correction equation for Spearman Brown and (t) test.

1- Range: used to classify some independent variables into categories according to the following law: (Al-Safawi, 2008: 208).

Range = highest value - lowest value

2- Paragraph difficulty factor: It is used to find the difficulty and ease of test items according to the following equation (Al-Zobaie and others, 1981, 75).

$$D.F = \frac{R}{n}$$

As:

D.f = Paragraph difficulty.

R = the total number of individuals who answered the paragraph correctly in the upper and lower groups.

n = total number of individuals in the upper and lower groups.

3- The power of distinguishing the paragraphs: - used to determine the Range of the ability of the paragraph to distinguish between individuals who are outstanding and individuals who are not good in the traits that the test measures, according to the following equation (Al-Zobaie et al., 1981, 79).

$$D = \frac{U-L}{1/2n}$$

As:

D = Paragraph strength

U = the total of the correct answers for the top set.

L = The total of the correct answers for the minimum set.

N = number of individuals in both upper and lower groups.

## Results and discussion

The first aim: Determining the level of knowledge of the beekeeper about the pests that afflict bees and methods of treating them in Al Mahawil district / Babylon province. The values expressing the knowledge level of the respondents were limited between (12 - 43) with an average of (26.24) degrees and a standard deviation (7.24). The respondents were distributed into three categories using the range, and the results were as shown in Table (5).

**Table (5) shows the distribution of the respondents according to their level of knowledge in general in the diagnosis and control of bee pests**

S.d	$\bar{X}$	Average knowledge	percentage	The number of respondents	Categories
7,24	26,24	18.64	34.83	31	12--22 is low
		27.79	48.32	43	23 - 33 medium
		37.53	16.85	15	34-44 High
			%100	89	Total

Table (5) shows that the largest percentage of respondents (48.32%) is the medium group, followed by the low group, indicating that the level of knowledge of beekeepers in diagnosing and controlling bee pests is medium, tends to be low. The reason for this may be the lack of experience that the beekeeper has to detect diseases and pests that afflict the colony since its inception and their reliance on personal experience in diagnosing and controlling bee pests. Diagnosis of infection requires high knowledge and experience, as well as the absence of guidance from specialized extension agencies in the field of beekeeping. The second aim: to determine the relationship of the association between the cognitive level of the beekeeper in diagnosing and controlling bee pests and the independent factors studied:

- 1- Age: The ages of the respondents ranged between (20 - 78) years, they were distributed according to the range into three categories, as shown in Table (6)

**Table (6) shows the distribution of the respondents according to age**

Value r	Average knowledge	percentage	The number of respondents	Categories
0.06 - N.S	24.14	39.33	35	Low (20 - 39) years
	28.37	53.93	48	medium (40-59) years
	21.5	6.74	6	High (60-79) years
		%100	89	Total

Table (6) shows that the highest percentage of the respondents (53.93%) and the highest average of their knowledge (28.37) is in the middle category, while the respondents ages (60-79) have the lowest average knowledge. The reason for this may be the lack of scientific experience they possess and their adherence to traditional methods. To find the correlation between age and the level of knowledge, the correlation coefficient was used (Pearson) and the value of the correlation coefficient was (- 0.06). It was found that the relationship is inverse between the two variables and is not statistically significant. Thus we accept the statistical hypothesis that states (there is no significant correlation between age and the level of knowledge of the beekeeper in the elimination of potentials in diagnosing and controlling bee pests) and this result is consistent with his findings (Al-Saidi, 2013) and (Medhas, 2017).

2- Academic achievement: the respondents were distributed according to their academic achievement, as shown in Table 7, where it was found that there are no illiterate individuals among the respondents.

**Table (7) shows the distribution of the respondents according to academic achievement**

Values rs	Average knowledge	percentage	number	Categories
<b>* 0.19</b>	<b>17.34</b>	<b>3</b>	<b>3</b>	<b>reads and writes</b>
	<b>23.53</b>	<b>17</b>	<b>15</b>	<b>Primary</b>
	<b>25.35</b>	<b>16</b>	<b>14</b>	<b>Secondary</b>
	<b>27.75</b>	<b>18</b>	<b>16</b>	<b>preparatory</b>
	<b>29.77</b>	<b>11</b>	<b>10</b>	<b>Institute</b>
	<b>26.81</b>	<b>25</b>	<b>22</b>	<b>College</b>
	<b>27.11</b>	<b>10</b>	<b>9</b>	<b>Master's Degree</b>
		<b>%100</b>	<b>89</b>	<b>Total</b>

**\*Indicates that the significant relationship is at (0.05) level**

The results showed that the highest percentage of respondents (25%) approximately "fall within the total category, while the highest average for knowledge (29.70) was in the category of the institute and the lowest percentage of the number of respondents (3%) with an average of knowledge (17.33) fall within the category of reading and writing in order to create a correlation. Between the two variables, the Spearman correlation coefficient was used, and the value of the correlation coefficient was (0.19). To test the significance of the relationship, the law (t) was used, and it was found to be significant at the level of (0.05). Thus, we reject the statistical hypothesis and accept the alternative hypothesis, which states (there is a significant correlation between academic achievement and the level of knowledge of beekeepers in spending attempts to diagnose and control bee pests), The reason for this may be that breeders who hold a higher scientific qualification are more in line with modern scientific developments because beekeeping needs to keep pace with modern science in diagnosing and controlling pests. This result is consistent with the findings of it (Al-Saeedi, 2013) and (Medhas, 2017).

The number of years of beekeeping: the number of years of experience in beekeeping ranged between (2 - 50) years, the respondents were divided into three categories using the range and as in Table - 8

**Table (8) shows the distribution of the respondents according to experience in beekeeping**

value r	Average knowledge	percentage	The number of respondents	Categories
* 0.22	24.96	73.03	65	Low (2-18) years
	30.13	24.72	22	medium (19-35) years
	25,10	2.25	2	High(36 years and more)
		%100	89	Total

**\*Indicates that the significant relationship is at (0.05) level**

Table (8) showed that the highest percentage of respondents (73.03%) fell into the low category, followed by the medium category (24.72%), which indicates that most of the respondents need to provide them with knowledge in diagnosing and controlling bee pests. To find the correlation relationship between the two variables, the correlation coefficient was used (Pearson), where the value of the correlation coefficient was (0.22). To test the significance of the relationship, the law (t) was used. The significance between the number of years of breeding and the level of knowledge of the beekeeper in spending time in the diagnosis and control of bee pests. The reason for this may be that the more years of beekeeping the breeders have, the more experience they have accumulated continuously in diagnosing and controlling bee pests. These results agree with (Al-Saeedi, 2013) and (Medhas, 2017).

**7 - Membership in beekeeping organizations: The respondents were distributed as shown in Table -9-**

**Table (9) shows the distribution of the respondents according to membership in beekeeping organizations**

Value rs	Average knowledge	percentage	The number of respondents	Categories
** 0.36	31	24	21	Associated with the Beekeepers Association
	24.77	76	68	Not affiliated with the beekeepers association
		%100	89	Total

**\*\* Indicates that the relationship is significant at the level (0.01)**

The results showed that the highest percentage of respondents (76%) fell within the category unrelated to the beekeepers association, while the highest level of knowledge (31) fell within a

group related to the beekeepers association. Relationship The law (t) was used, and it was found to be significant at the level (0.01). Thus, we reject the statistical hypothesis and accept the alternative hypothesis that states (there is a significant correlation between membership in beekeeping organizations and the level of knowledge of beekeepers in spending attempts in diagnosis and pest control).The reason for this may be that all those associated with the beekeepers association have acquired knowledge about diagnosing and controlling bee pests during their participation in the courses held by the Beekeepers Association in the province or in other provinces or in the conferences of the Arab Beekeepers Association held in Arab countries as well as their participation in exhibitions and scientific workshops About beekeeping, all of that and others made them highly knowledgeable

8- Information sources: The values expressing the sources of information that are obtained in the field of diagnosing and controlling bee pests in the district of Al-Mahawil are between (9-36). The respondents were divided into three categories according to the range and as shown in Table 10

**Table (10) shows the distribution of the respondents according to sources of information**

Value rs	Average knowledge	percentage	The number of respondents	Categories
** 0.53	23.15	36	32	Low (9-17)
	23.76	34	30	Medium (18-26)
	32.66	30	27	High (27-36)
		%100	89	Total

**\*\* Indicates that the relationship is significant at the level (0.01)**

Table (10) showed that the highest percentage of respondents (36%) fell within the low category, and the highest average for knowledge was (32.66) in the high category. To find the correlation relationship between the two variables, the Spearman law was used and the value of the correlation coefficient was (0.53). To test the significance of the relationship, use the law (t).It was found to be a significant (0.01) level, and thus we reject the statistical hypothesis and accept the alternative hypothesis that states (there is a significant correlation relationship between the sources of information and the level of knowledge of the beekeeper in spending transfers in diagnosing and controlling pests). The reason for this may be that the more diverse sources of information related to Bee pests, which the breeder gets, this leads to an increase in his knowledge and becomes more knowledgeable in the diagnosis and control of pests. This results agree with (Al-Saeedi, 2013).

**Third aim : Identify the problems facing beekeepers in Al Mahawil District / Babylon province.**

The problems facing beekeepers in the district of Mahawil / Babylon province were arranged in descending order according to the arithmetic average, and the results were as shown in Table -11-

**Table (11): The order of the most important problems facing the beekeeper, in descending order**

order	average	The problems that face beekeepers in diagnosing and controlling bee pests
1	3.75	The spread of disease and pest infestation

2	3.38	The lack of local product protection and the abundance of imported honey
3,5	2.84	The effect of pesticides used in agriculture on bee activity in the area
3,5	2.84	Many apiaries and lack of nectar sources
5	2.65	Lack of pure strains
6	2.55	Lack of extension activities in the field of beekeeping
7	2.41	High prices for beekeeping supplies
8	2.37	Lack of government support

Maximum value = 4

The results in Table(11) that the averages of all the studied problems were large, which reflects the size of the problems that the respondents suffer from. The problem (prevalence of disease and pests) ranked first with an average of (3.75). The reason for this may be due to the severity of the effects of diseases and pests suffered by beekeepers and their effect on honey production and the numbers of colonies, while the problem (lack of protection for the local product and the abundance of imported honey) came in second place with an average of (3.38) degrees and it may be the cause This is because imported honey is not subjected to strict control and quality control, which affects the prices of local honey and the loss of farmers. While the problem of (lack of government support) came last, and the reason may be that most breeders rely on themselves to secure production supplies from local markets and do not think about what the government might provide in terms of beekeeping supplies.

### Conclusions:

- 1- It was found from the results of the study that the knowledge level of the beekeeper in diagnosing and controlling bee pests in Al Mahawil district, Babylon province is medium tends to low. From this we conclude from this the lack of knowledge that the beekeeper possesses in detecting diseases and pests that afflict the colony since its inception, as well as the absence of guidance from the specialized extension agencies in the field of beekeeping
- 2- The results showed that the correlation is inversely related between the knowledge level of the beekeeper in diagnosing and controlling bee pests and age. from this we conclude from this the need of the elderly beekeepers to increase extension activities to increase their level of knowledge.
- 3- The existence of a positive significant correlation between the cognitive level of the beekeeper in diagnosing and controlling pests and the following independent factors (training in the field of bee protection and membership in beekeeping organizations). We conclude from this the importance of these factors in increasing the knowledge level of the beekeeper.
- 5- There is a positive significant correlation between the beekeeper's knowledge level in diagnosing and controlling pests and (sources of information). We conclude from this the importance of increasing and diversifying the sources of information to increase the knowledge of beekeepers in the field of diagnosis and control of bee pests.
- 6- The results showed a high average of problems facing beekeepers. We can deduce from this the extent of suffering faced by beekeepers in the research area.

### Recommendations:

1- Intensifying extension efforts by holding informative meetings and seminars to raise the level of knowledge of the beekeeper in the research area regarding general practices of beekeeping and the use of extension campaigns in cases requiring disease control (Nosema, Varroa and American and European Foul Brood Disease).

2- The need to work on establishing branches for beekeepers' associations in the district of Al-Mahawil and the various districts of the province to work in cooperation with the extension staff in the province in order to increase the knowledge level of beekeepers in the field of beekeeping.

4- The need to pay attention to practical guidance, through the implementation of the indicative apiaries project, to provide beekeepers in the district of Al-Mahawil in particular, and the breeders of Babylon province in general, different knowledge in diagnosing and controlling bee pests.

5- Increasing the sources of information and facilitating access to it by beekeepers and using local TV channels to broadcast programs for beekeeping by specialized experts to increase the knowledge of beekeepers.

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