

## The Training needs of beekeepers in the fields of feeding and pollen supplements in Rashidiya area / Baghdad governorate

\* Khalida shawkat.M \*\*Samer Muhii Taha \*\*\* Ahlam Talib \*Enas Jabbar Hasan

\* College of Basic Education / University of AL-Mustansiriya, Iraq.

\*\* College of Agriculture / University of Al-Qasim Green, Iraq

\*\*\*Department Of Extension And Transfer Agricultural Technologies / College of Agriculture / University of Baghdad, Iraq

### Abstract

The current research aims at identifying the training needs of beekeepers in the fields of feeding and pollen supplements in Rashidiya area / Baghdad governorate. Research community consisted of 45 beekeepers at the period of data collection. Research results showed that the training needs of beekeepers fall within the low level, and that more than two-thirds of the beekeepers (45.36%) fall within the level of need that requires urgent and necessary training, and that there was a variation in the following training fields: quantity of feeding and timing of feeding (48.9%); they almost formed half of the beekeepers' training needs, as well as the other fields: feeding methods, feeding sign and feeding goals which formed (46.7%, 44.5%, 38.1%) respectively, with converging proportions regarding the level of necessary needs in the near term to provide guidance services to them. Research results showed a significant positive correlation relationship between the training needs and the following independent factors (educational level, extension activities and productivity), as well as a significant negative correlation relationship between training needs and the following independent factors (age and number of beehives). A questionnaire tool was used to collect data from the research society. Percentage, arithmetic average, weighted average, simple correlation coefficient and t test to analyze the data were used.

The research included a number of recommendations that aimed at enhancing the training performance of beekeepers, which would be reflected positively on improving the productivity and production of farm system in the research area.

### Introduction and research problem

*Apis mellifera* honeybees are insects of an economic importance, and beekeeping is considered a fortune and a profession, as it is the only way to produce honey, in addition to the many bee products like royal food, pollen, bee venom, beeswax, royal jelly, honey bee packages, propolis, and many products that are sold at exorbitant prices, which help beekeepers to diversify sources of income and thus maintain stability in agricultural work. They are also of significant importance to increasing plant production (Al-Tamimi and Khniss 2009, Leal 2001), as bees are one of the most important means to assist in the pollination of fruit trees and some crops and vegetables, i.e. they increase the amount of production by at least 25%, and this contributes to the increase of production per area/unit and achieves a bumper profit. Bees depend in their food on nectar and pollen. Pollen play a vital role in a beehive in terms of productivity rate, as it is the main source to fill the needs of protein, minerals, vitamins and fat needed to build body cells and make up for lost ones (Al-Ghusn 2004).

The lack or absence of pollen is one of the most important problems facing bees, which happens because of the scarcity of rain in winter and high temperatures in summer, leading to the loss of many bee colonies.

The feeding of bees requires know-how by beekeepers. In summer and winter, bees need supportive or supplementary food, which combines several substances or is only one substance; they are divided into two types: the first type is carbohydrate feeding; it includes feeding bees with sugar solutions or honey. The second type is protein feeding, which is of three modes: first, pollen alternative, second: supplementary, where one material or more are added to pollen and the third type is natural pollen only (Nabors, 2000, ALGamadi, 2002). Feeding with nectar alternatives also stimulates bees to build wax in spring before the nectar season, and in autumn to be able to survive winter (Scot, 2005). Therefore, it is vital to maintain the strength and activity of honey bee colonies, keeping them from starving and improving their performance by providing them with supporting food alternatives and pollen and nectar supplements (Alsharhi, 2007).

The Activity of beekeeping is an economic field in Iraq, which is in turn an agricultural country rich in food sources needed by bees as it ranks fifteen in that concern (Food and Agriculture Organization of 0.2013). The production of honey was more than 15 kg / beehive, but the difficult conditions experienced after 2003, has made production fall to 7 kg / beehive at best (Hasnawi 2010), and lowered the quality of honey production as well (Abbas et al., 2010). This is due to the deterioration of bee colonies, frequent deaths, erroneous practices by beekeepers who do not use modern methods in breeding queens (instead, adopting old, traditional methods), lack of extension and training activities (Ajili, 2006), as well as technical problems related to the lack of experience by beekeepers to produce royal jelly (al-Azzawi, 1999). At present, agricultural work has seen an introduction of modern technologies and many developments and improvements that have helped define many aspects of the importance of bees feeding (Ali, 2011). So, it is necessary to raise the level of performance of beekeepers in the fields of feeding through training them on topics that help them confront and address the various aspects of beekeeping, focusing on feeding in particular (Qallaf 0.2008 ), and reducing behavioral gap (Mohammad & Shideed 2006). Successful extension work is based on gaining the trust of targeted individuals by knowing their needs and the training needs of beekeepers in order to improve their knowledge and skills (al-Azzawi, 2006), and to help them solve their problems as well as participating with them in all stages of extension work, as they are more familiar with their conditions. The effectiveness of extension work depends on the basis of identifying and knowing the tangible and intangible needs of the targets and meeting their real desires and interests. A need is a legitimate desire that requires fulfillment (Marei 2001). Kubaisi 2010 underlines the necessity to identify training needs in order to sort the problems and determine the general and specific goals of the training programs for bees. Ensuring the achievement of such a move depends on the identification and diagnosis of beekeepers' training needs as a basis upon which effective and influential guidance and training programs are built, and from which they start. Therefore, we find it important to conduct this research, which targeted the following:

1. Identifying the beekeepers' training needs in the field of feeding and pollen supplements in al-Rashidiya area.
2. Identifying the beekeepers' training needs in the field of feeding and pollen supplements, according to the following themes:

Goals of bee feeding, feeding methods, feeding signs (beehive's need for food), quantity of feeding, feeding timing.

3. Measuring the relationship between training requirements and some independent factors (age, educational level, extension activities, productivity, number of beehives)

**Materials and methodology:**

1. Research methodology: the current research is classified as part of the exploratory research that fall within the descriptive approach. (Melhem, 2000) indicated that such research provide data and information on the reality of a particular phenomenon or society.
2. Research society: it included all beekeepers in al-Rashidiya area's fields (45 beekeepers) in the period of data collection as shown in Table 1.

**Table1. Research society according to research area**

Order	Research area	Number	Order	Research area	Number
1	Al-Sawamra	4	8	Markaz al-Nahiya	4
2	Kadhim Ali village	2	9	Al-Arakna	3
3	Al-Bu Dali Al-Shamali	4	10	Al-Khuds	3
4	Al-Wakf	3	11	Al-Mazraa Al-Irshadiya	2
5	Al-Bu Dali Al-Janubi	3	12	Suraidat	4
6	Al-Waha Al-Khadraa	4	13	Al-Fahama	2
7	Al-Mursalat	5	14	Suraidat (Al-Jala'ta)	2
	Total				45

3- Construction of scale: the construction of beekeepers' training needs scale in the field of feeding and pollen supplements included the following stages:

Stage I: preparing the initial scale of beekeepers' training needs in the field of feeding and pollen supplements through literature and guidance publications related to the agricultural extension and plant protection, it consisted of 21 items distributed on five themes and 15 elements, as shown in Table 2.

**Table 2 Initial scale of beekeepers' training needs in the field of feeding and pollen supplements**

Theme	Element	Item	Level of training need			
			Very urgent	Urgent	Moderate	Little
Bee feeding goals	Prevention of starvation	Lack of flowering plants				
		Lack of the ability of bees to fly				
		Cooler air in winter				
	Stimulation of colony	Activity of colonies in brood production as soon as warm air is there				
		Drying of flowers or evaporation of nectar in summer				
		stimulating colonies to produce brood before flowering season				
Strengthening bee nuclei	Strengthening the nuclei of bees resulting from division and feeding packed bee swarms					
Feeding methods	Self-feeding	Using cells containing stored honey, it often has a dark color				
	Sugar solution feeding	Using a solution composed of pure cane sugar and water				
	Pollen and pollen alternative feeding	Pollen is the main source of protein material, mineral salts and vitamins in the diet of honey bees, be they larvae, worker bees or males				
	Candy feeding	Worker bees accompanying the queen feed so that they are able to supply queens with royal food during shipping.				
Feeding signs (beehive's need for feeding)	Bees	larvae and pupae are cast outside the beehive				
		Males are expelled outside the beehive in of near-death case and are not allowed to enter				
			A large number of dead bees inside brood combs			
Quantity of feeding	Candy feeding	Using the solution (3 powder sugar: Honey glucose)				
	Protein feeding	Medical dry brewer's yeast is used by (3 Sugar, 2 Yeast, 1 Water).				
	Granulated sugar feeding	Feeding with granulated sugar by applying sugar on the internal cell cover.				
Feeding timing	Early Spring	Colonies are fed with sugar solution to stimulate the queens to lay eggs				
	Summer	Feeding vulnerable colonies or those in which swarming took place				
	Autumn	The proportion of water is reduced by 2 sugar, 1 water				
	Early Winter	Sugar-based food is provided for cells from which honey has been harvested.				

Stage II: The initial scale of beekeepers' training needs in the field of feeding and pollen supplements was forwarded to a group of 9 experts specialized in the fields of plant protection and agricultural extension, to ask for their opinion regarding the items of the proposed scale, and for the requisite adjustments needed in order to come up with a final version of the scale, as shown in table 3.

**Table 3 Expert opinion to come up with a final version of beekeepers' training needs scale**

Initial feeding and pollen supplements scale:

Alternatives	Fields		Themes		Items	
	No.	%	No.	%	No.	%
Valid	7	77.78	8	88.89	6	66.67
Valid with alterations	1	11.11	1	11.11	2	22.22
Invalid	1	11.11	0	0	1	11.11
Total	9	100	9	100	9	100

Accordingly, the themes and items of the scale that were reached in the light of the views of experts were retained.

Stage III: A quadrant measure was used for the initial scale of beekeepers' training needs in the field of feeding and pollen supplements which consisted of four levels as follows: very high, high, moderate and low. A score was given to each level as follows: 4 degrees, 3 degrees, 2 degrees and 1 degree respectively. Thus, the lowest score of the scale was 1 degree, and the highest was 84 degrees with an average of 42 degrees.

**Data collection tool validity:** the data collection tool (the questionnaire) with all of its contents (themes, fields and items), was forwarded to a group of experts in plant protection and agricultural extension numbered (9 experts). It was approved by most experts as shown in the table. 3.

**Reliability of data collection tool:** A first test of the questionnaire was conducted in October 2013 on a random sample of 16 beekeepers, Pearson correlation coefficient split-half method was used to examine reliability and it was valued at 0.92 and was corrected by using Spearman Brown equation, whereby it amounted to 0.95. To verify scale validity, the reliability coefficient root was found, amounting to 0.98. The questionnaire was used as a tool for data collection with the following statistical means: percentage, Pearson correlation coefficient, arithmetic average, weighted average and T test.

### Results and discussion

First: Determining the beekeeper training needs in the field of feeding and supplements pollen:

To find out beekeepers' training needs in the field of feeding and pollen supplements, the weighted average of the level of need for beekeepers' training was calculated and arranged according to the weighted average, as shown in Table 4.

**Table 4 Beekeepers' training needs in the field of feeding and pollen supplements in the al-Rashidiya area / Baghdad governorate**

Themes	Beekeepers' training needs in the field of nutrition and pollen supplements								Weighted average
	Very high		High		Moderate		low		
	No.	%	No.	%	No.	%	No.	%	
Bee feeding goals	5	11.1	10	22.2	13	28.9	17	38.1	2.06
Feeding methods	6	13.3	6	13.3	12	26.7	21	46.7	1.93
Feeding signs	4	8.9	7	15.5	14	31.1	20	44.5	1.88
Feeding quantity	6	13.3	8	17.8	9	20	22	48.9	1.95
Feeding timing	5	11.1	9	20	9	20	22	48.9	1.93
Total		11.54		17.76		25.34		45.36	
Research society = 45 beekeepers									

It is shown in Table 4 that the highest beekeepers' training need in the field of feeding and pollen supplements was in the theme of feeding goals as the weighted average was 2.06 degrees. The lowest need for training was In the theme of feeding signs with a weighted average of 1.88 degrees. 45.36% of the beekeepers fall within the low level. This may be attributed to the beekeepers' need to be aware of honey bees' need to carbohydrate and protein food for the continuation of life and reproduction, as well as the right time to provide bee colonies in early spring with an additional mixture to stimulate the queen to lay eggs at an early time and to increase colony productivity of brood and honey (Faisal Khalil 2011).

Second: determining beekeepers' training needs in the field of feeding and pollen supplements, according to the following themes:

2-1: beekeepers' training needs in the theme of feeding goals

To find out training needs for beekeepers in field of feeding goals, the weighted average of beekeepers' need for training was calculated and arranged according to the weighted average, as shown in Table 5.

**Table5 Beekeepers' needs in field of feeding goals in al-Rashidiya area / Baghdad governorate**

Theme	Items	Beekeepers' training need in the field of nutrition and pollen supplements								Weighted average
		Very high		High		Moderate		low		
		No.	%	No.	%	No.	%	No.	%	
	Lack of flowering plants	5	11.1	9	20	11	24.4	20	44.5	1.97
	Lack of the ability of bees to fly	2	4.4	13	28.9	10	22.2	20	44.5	1.93
	Cooler air in winter	6	13.3	11	24.4	15	33.4	13	28.9	2.22
	Activity of colonies in brood production as soon as warm air is there	7	15.6	8	17.8	14	31.1	16	35.5	2.13
	Drying of flowers or evaporation of nectar in summer	4	8.9	12	26.7	11	24.4	18	40	2.04
	stimulating colonies to produce brood before flowering season	6	13.3	8	17.8	15	33.4	16	35.5	2.08
	Strengthening the nuclei of bees resulting from division and feeding packed bee	5	11.1	9	20	14	31.1	17	37.8	2.35
Total			11.1		22.2		28.6		38.1	

It is shown in Table 5 That the highest beekeepers' training need is in (strengthening the nuclei of bees resulting from division and feeding packed bee), as the weighted average was 2.35 degrees. The lowest training need was in the (lack of the ability of bees to fly) with a weighted average of 1.93 degrees. 38.1% of beekeepers were within the low level.

#### 2-2: Beekeepers' training needs in the theme of feeding methods

To find out the training beekeepers' needs in the field of feeding methods, the weighted average of beekeepers' need for training was calculated and arranged according to the weighted average, as shown in Table 6.

**Table 6 Beekeepers' training needs in the field of feeding methods in al-Rashidiya / Baghdad governorate**

Theme	Items	Beekeepers training need level and pollen supplements								Weighted average
		Very high		High		Moderate		Low		
		No.	%	No.	%	No.	%	No.	%	
Self-feeding	Using cells containing stored honey, it often has a dark color	4	8.9	9	20	7	15.5	25	55.6	1.82
Sugar solution feeding	Using a solution composed of pure cane sugar and water	6	13.3	6	13.3	10	22.2	23	51.2	1.88
Pollen and pollen alterative feeding	Pollen is the main source of protein material, mineral salts and vitamins in the diet of honey bees, be they larvae, worker bees or males	9	20	3	20	18	40	15	33.3	2.13
Candy feeding	Worker bees accompanying the queen feed so that they are able to supply queens with royal food during shipping.	5	11.1	6	13.3	13	28.9	21	46.7	1.88
Total			13.3		13.3		26.7		46.7	

As shown in Table 6, the highest training need was in the item (Pollen is the main source of protein material, mineral salts and vitamins in the diet of honey bees, be they larvae, worker bees or males), as the weighted average was 2.13 degrees, and that is attributed to the fact that pollen is the main source of proteins and vitamins that are necessary for the construction of body tissues during metabolic processes. The lack of pollen can lead to some pathological conditions (Hel. 1985). The lowest training need was in the item (Using cells containing stored honey, it often has a dark color), with a weighted average reaching 1.82. 46.7% of beekeepers were within the low level.

2-3: beekeepers training needs regarding the theme of undernutrition signs:

To find out beekeepers training needs regarding the theme of undernutrition signs, the weighted average for beekeepers' training need was calculated and arranged according to the weighted average, as shown in Table 7.

**Table7. Beekeepers' training needs regarding the theme of undernutrition signs**

Themes	Items	Beekeepers' training need level and pollen supplements								Weighted average
		Very high		High		moderate		low		
		No.	%	No.	%	No.	%	No.	%	
	larvae and pupae are cast outside the beehive	5	11.1	7	15.6	15	33.3	18	40	1.97
	Males are expelled outside the beehive in of near-death case and are not allowed to enter	3	6.7	8	17.8	15	33.3	19	42.2	1.88
	A large number of dead bees inside brood combs	4	8.9	6	13.3	12	26.7	23	51.1	1.8
Total			8.9		15.6		31.1		44.4	

It is shown in Table 7 that the highest training need was in the item (larvae and pupae are cast outside the beehive), as the weighted average was 1.97 degrees, as the lack of bee food can lead to some pathological conditions (Hel, 1985). The lowest training need was in the item (A large number of dead bees inside brood combs), as the weighted average was 1.8 degrees. 44.4% of beekeepers were within the low level.

2-4: beekeepers' training needs regarding the theme of quantity of feeding:

To find out beekeepers' training needs regarding the theme of quantity of feeding, the weighted average of beekeepers' need for training was calculated and arranged according to the weighted average, as shown in Table 8.

**Table 8 Beekeepers' training needs regarding the theme of quantity of feeding**

Theme	Item	Beekeepers' training need level and pollen supplements								Weighted average
		Very high		High		Moderate		Low		
		No.	%	No.	%	No.	%	No.	%	
Candy feeding	Using the solution (3 powder sugar: Honey glucose)	5	11.1	9	20	7	15.6	24	53.3	1.8
Protein feeding	Medical dry brewer's yeast is used by (3 Sugar, 2 Yeast, 1 Water).	6	13.3	8	17.8	11	24.5	20	44.4	2
Granulated sugar feeding	Feeding with granulated sugar by applying sugar on the internal cell cover.	7	15.6	7	15.6	9	20	22	48.9	1.97
			13.3		17.8		20			

It is shown in Table 8 that the highest training need was in the item (Medical dry brewer's yeast is used by 3 Sugar, 2 Yeast, 1 Water), as the weighted average was 2 degrees, and that the lowest training need was in the item (Using the solution (3 powder sugar: Honey glucose) as the weighted average was 1.8 degrees. 48.9% of beekeepers were within the low level.

2-5: beekeepers' training needs in the theme of feeding timing

To find out beekeepers' training needs for, the weighted average beekeepers' need for training was calculated and arranged according to the weighted average, as shown in Table 9.

**Table 9 Beekeepers' training need regarding the theme of feeding timing**

Theme	Item	Beekeepers' training need level and pollen supplements								Weighted average
		Very high		High		Moderate		Low		
		No.	%	No.	%	No.	%	No.	%	
Early Spring	Colonies are fed with sugar solution to stimulate the queens to lay eggs	4	8.9	11	24.4	8	17.8	22	48.9	1.93
Summer	Feeding vulnerable colonies or those in which swarming took place	4	8.9	7	15.6	10	22.2	24	53.3	1.8
Autumn	The proportion of water is reduced by 2 sugar, 1 water	5	11.1	10	22.2	9	20	21	46.7	1.97
Early Winter	Sugar-based food is provided for cells from which honey has been harvested.	7	15.6	8	17.8	9	20	21	46.7	2.02
Total			11.1		20		20		44.9	

It is shown in Table 9 that the highest training was needed in the item (Sugar-based food is provided for cells from which honey has been harvested), as the weighted average was 2.2 degrees, and the lowest need was in the item (Feeding vulnerable colonies or those in which swarming took place), with a weighted average of 1.8 degrees. 48.9% of beekeepers were within the low level, and this is due to the weather conditions that play an important role concerning beekeeping and honey production, as these insects can be affected by severe heat, extreme cold, high winds and lack of lighting. Climatic factors affect bees' temper and queens' ability to lay eggs, as well as affect the plants and the amount of nectar, and increase the concentration of sugars in nectar and honey, thus causing abundant harvest, which affects examination and its timing and the rest of the daily activities within the apiary carried out by beekeepers (Azzawi Ali and Ahmed, 2009).

3: determining the relationship between beekeepers' training needs in the field of feeding and supplements pollen, and each of the independent factors.

To determine the relationship between training needs and the independent factors (age, educational level, extension activities, productivity) the Pearson correlation coefficient was used and as shown in Table 10.



**Table 10 Distribution of respondents according to the independent variables and their relationship to training needs.**

Order	Independent factors	Categories	Number of respondents	%	Mean training need	Simple correlation Pearson/Spearman coefficient	Calculated t value	Tabular t value
1	age	23-31	9	20	56.3	0.32*	2.21	1.67
		32-40	10	22.2	36.7			
		41-49	12	26.7	42.5			
		50-58	8	17.8	30.8			
		59 and older	6	13.3	42.5			
2	Educational level	Illiterate	4	8.9	26.75	0.39**	2.77	1.67
		Literate	5	11.1	39			
		Primary school	12	26.7	36.6			
		Middle school	11	24.4	43.9			
		Preparatory school	11	24.4	53.6			
		College or above	2	4.5	33.5			
3	Extension activities	Always	8	17.8	47.5	0.29*	1.9	1.67
		Sometimes	5	11.1	49.8			
		Rarely	13	28.9	43.8			
		I do not contact	19	42.2	36.2			
4	Productivity categories/kg	10-13	14	31.1	40.8	0.11	0.72	1.67
		14-17	10	22.2	36.3			
		18-21	9	20	35.4			
		22-25	10	22.2	56.8			
		26 and more	2	4.5	32.5			
5	Number of beehives	10-13	28	62.2	42	-0.034	0.22	0.22
		14-17	15	33.3	42.9			
		18 and more	2	4.5	32.5			
Total			45	100				

From Table 10 results showed that the highest age category was 59 years and it made up 13.3%, and the minimum age category was 23 years and it made up 20%. There was a negative correlation relationship between and beekeepers' age training needs. To verify the significance of the relationship, t was used. The relationship was significant at the level of 0.01.

This is due to the fact that most offered training activities are of a general nature that does not take into account the age of the target. Furthermore, aging beekeepers need more training courses.

**Educational Level:** it was showed that the lowest educational category was (illiterate) and it made up 8.8%, and the highest category was primary school and it made up 26.6%. There was a positive correlation relationship between the beekeepers' educational level and training needs, and to verify relationship significance, t was used, showing that the relationship was not significant at the level of 0.01 and this is attributed to the fact that most educational groups permanently and continuously seek to get the best information and from multiple sources. In addition, continuing education to higher levels reduces the need for training.

**Extension activities:** it was showed that the lowest category in extension activities was (sometimes) making up 11.1% and the highest category was (I do not contact) making up 42.2%. There was a positive correlation relationship between training needs and extension activities relationship. To verify the significance of the relationship, t was used, showing significance at the level of 0.01. That is due to the fact that most beekeepers permanently and continuously seek to participate in most of the activities held by the development agencies, particularly the agricultural extension organizations in order to obtain information from a variety of sources, making training less needed.

Productivity: it is shown that the lowest category was (26 and more), making up 4.5% and the highest productivity level was in the category of (10-13) making up 31.8%. There was a positive correlation relationship between productivity and beekeepers. To verify the significance of the relationship, t was used, showing that the relationship was not significant at the level of 0.01. That is attributed to the fact that beekeepers need to use modern methods of production, i.e. the lower the productivity is the more training needed by beekeepers.

The number of beehives: it was shown that the lowest category in the number of beehives was (18 and older) making up 4.5%, and the highest category of productivity was (10-13) making up 62.5%. There was a negative correlation relationship between the number of beehives and beekeepers. To verify the significance of the relationship, t was used, showing that the relationship was not significant at the level of 0.01. That may be attributed to the need for beekeepers to continue to seek information in order to address information shortage.

## Conclusions

1. The results show that the beekeepers' need falls within the low level.
2. There is a variation in the level of beekeepers' need, as more than two-thirds of them (45.36%) fall within the level of need that requires urgent and necessary training. There was a variation in the training fields: quantity of feeding and timing of feeding (48.9%) as they almost formed half of the need for training, as well as the rest of the fields: feeding methods, feeding signs and feeding goals forming (46.7%, 44.5%, 38.1%) respectively with converging levels for the necessary needs in the near term to provide guidance services to them.
3. There was a significant positive correlation relationship between training needs and the independent factors (educational level, extension activities and productivity).
4. There was a significant negative correlation relationship between training needs and the independent factors (age and number of beehives).

## Recommendations

1. It is necessary to give more attention in the field of honey production by development agencies to contribute to agricultural work through the promotion of investment in this field, which is vital and influential to the living standard of rural families.
2. Enhancing the role of agricultural extension in the provision of services to beekeepers by setting efficient and effective guidance and training programs that meet their needs.
3. Providing success requirements such as loans and advances with reasonable benefits, being subsidized by the state.
4. Developing awareness of the importance of specialized work through the rehabilitation of specialist agricultural counselors for beekeeping.

## References

- Tamimi, Khaled Mohammed Said Khanbash. 2009. Studying the role of honeybees in the pollination of coriander flowers (*Coriandrum sativum*). Sixth Conference of the Union of Arab beekeepers Abha, Saudi Arabia, for the period from 17-19 / 3/2009, p. 22.
- Hasnawi, Muntadhar Sabah. 2010. Beekeeping in Iraq. <http://www.na7la.com/newsarab4.html>
- Alsharhi Mohammed Mohsen, and Ahmed Bin Abdullah Al-Ghamdi. The impact of winter pollen supplement feeding on bee colony activities in spring, Plant Protection Department, College of Food and Agricultural Sciences, King Saud University, Saudi Arabia
- Annual Volume of Agricultural Statistics, Vol. 33, the Arab Organization for Agricultural Development, Khartoum 2013
- Kubaisi, Amer O.2010, administrative and security training: a contemporary vision of the 21<sup>st</sup> century, Studies and Research Center, Naif Arab University for Science, Riyadh.

- Ajili, Sahab Ayed 2006, beekeepers problems in Salahuddin governorate, Tikrit Journal of Agricultural Science, Volume 6, Issue 3.
- Al-Azzawi, Nadia Kazem.1999. Cognitive guidance needs for beekeepers in the governorate of Baghdad, Master Thesis, Department of Agricultural Extension, Faculty of Agriculture, Baghdad University.
- Al-Azzawi, Najm Abdullah 2006 management training, Arabic edition, Amman Dar Yazouri for scientific publication and distribution.
- Ali, Abdul Baqi Mamed.2011. Beekeeping..s20-28 First Edition.
- A-Ghusn, Nasser Ibrahim 2004 honey bees and plants, Saudi Arabia, Edition 2 for publication
- Al-Kalaf, Abdul Alamir.2008. Apiaries and development. Ministry of Agriculture and Livestock.
- Habib, Faisal Mahmud, and Khalil Ibrahim Makees. 2011. The effect of supplementary feeding in autumn and early spring on the productivity of private honey bee colonies. Tishreen University Research and Scientific Studies magazine - Biology Science series, Vol. 33, No. 6, S47-58.
- Abbas, Ala Sharif. Kamilh WardShaher and Ridha Sagab Jurani 2010. The study of the prevalence of American European brood sepsis among the honey bee colonies in the central region of Iraq. Anbar Journal of Agricultural Science, Volume: 8.Issue 4 .P 426.
- Faisal Mahmoud Habib, Khalil Ibrahim 0.2011. The impact of additional feeding in autumn and early spring on the productivity of private honeybee colonies. Tishreen University for research and scientific studies magazine. Series of Biological Sciences, Vol. 33, No. 6, S47-58.
- Mari, Mohammed Farhan al-Bashir. 2001. Human Needs, an approach to the Islamic economic theory, Edition 1. Research House for Islamic Studies and Heritage Revival, Dubai, p. 27.
- Melhem, Sami Mohammed 2000, Research systems for Education and Psychology, the first edition, Al-Maserah House for Publishing and Printing, Amman, p. 333.
- Helmich.R. L., and W.C. Rothenbuhler.(1985). Pollen hoarding and use by high and low pollen hoarding honey bees during the course of brood rearing.J. Apic. Res., 25, 30-34(1986).
- Shideed , Kamil H. and Mohammad El-Mourid(2006) . Adoption and Impact Assessment of Improved Technologies Crop and Livestock Production Systems in the Dry Areas , ICARDA IFAD .
- Scot,H.2005.Feeding basics. Amer. Bee J. 45(8):627-628.
- Leal, G.and B.A. Dickson.2001. Pollination. Dept. of botany and institute for environmental studies.Univ. of Washington. Pp.33.
- Nabors. 2000.Theeffects of spring feeding pollen substitute to coloies of Apis melliifera L. Amer. Bee J.140(4):322-323.
- Al- Ghamdi, A. 2002. The effect of pollen supplementary feeding on some activities of honey bee colonies during summer season in Riyadh, Saudi Arabia- Saudi J. Biol. Sci. 9(2):85-94.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

### CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

**Prospective authors of journals can find the submission instruction on the following page:** <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

### MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

### IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

