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The Level of Realization of Scientific Recommendations for The Cultivation and Care of The Crop by The Sesame Farmers and The Obstacles to Their Realization in Ashur Subdistrict, Sharqat District

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Abstract: The study was set to find out the level of implementation of scientific recommendations for sesame cultivation and crop management as well as identify the obstacles that hinder the implementation of scientific recommendations by the farmers in the sub-district of Ashur in the district of Sharqat. In order to meet the research goals, a questionnaire containing items regarding scientific recommendations for sesame cultivation and crop management and a set of items regarding the difficulties faced in the implementation of the recommendations has been developed. Data were gathered from 52 sesame farmers of the study area and analysed by applying the suitable statistical tools in the SPSS. The findings revealed that the implementation of the recommendations applied to sesame cultivation and management by the farmers was moderate and leaning towards low, thus it is recommended to improve extension and training programs and activities in sesame farming to increase the level of implementation of recommended agricultural practices by the farmers. The results also indicated a series of constraints which inhibit the implementation of the scientific recommendations, mostly due to the absence of harvesters for the sesame crop. This can be explained by the lack of modern technologies and government support for supplying the modern technologies to the sesame farmers that are used to boost the production and productivity and the efficiency of sesame crop production in the study area. The study has found that strengthening the implementation of scientific recommendations for sesame cultivation and crop management needs to be strengthened, with increased efforts from the agricultural extension service, timely transfer of modern agricultural innovations to the farmer, provision of production inputs, which is very important for improving and increasing production, as well as improve its efficiency. Traditional farming practices and knowledge that have not evolved with the advancements in agriculture and technology nor with the supply of improved seeds and pesticides for sesame continued to be relied on by the farmers in the region.

Keywords: Sesame, Obstacles to Implementation, Ashur District, Sharqat County, Iraq

1. Introduction

The agricultural sector is one of the most significant economic sectors in Iraq because of its crucial role in food production and in sustaining the livelihoods of rural and farming households, its role in achieving food security and its impact on rural and farming families' income. The need for the development of agricultural production is enhanced by the

problems of the Iraqi agricultural sector including land degradation by nature, climate change, lack of water resources, and high production cost, which necessitates the need to improve the efficiency of agricultural resources and adopt modern methods and technologies [1]. Improving agricultural production depends on improvement of agricultural practices, availability of research and extension services relevant to the local context, and enhanced connection between agricultural extension, scientific research, and farmers through the transfer of skills, knowledge and modern technologies [2]. The oil-rich, high protein rich seeds of sesame (*Sesamum indicum* L.) are not only used in industry, food but also regarded as one of the most important crops for oil production. The side products are also used in animal feed and are processed into fodder, oils and/or protein. Sesame is a crop that is drought and high-temperature resistant, and is suitable to Iraq's climatic conditions. [3].

Another study conducted in Iraq also proved that irrigation water management and fertilization are vital factors affecting the productivity of sesame crop. It was found that the irrigation interval and potassium fertilization influences the yield of sesame seed. A good crop of sesame requires a series of scientific suggestions about the stages of cultivation and crop management, beginning with variety selection, soil preparation, seedbed preparation, planting date, and appropriate variety selection, weeding and weed control, and control of irrigation and fertilization – to ensure a good and high yield [4]. On one hand Agricultural extension services and Agricultural extension agents have a heavy responsibility in the transfer of modern techniques to farmers and in providing farmers with the knowledge and skills needed to achieve production and productivity and in the proper application of these techniques through training [5]. The researcher faced the low yield and poor quality of the sesame crop in Ashur (in the Sharqat District) when sesame is regarded as one of the important cash crops that yield the farmers, so the researcher faced the most important problems of the farmers in cultivation of sesame and evaluated the existence of farmers' application of the scientific recommendations of cultivation. The intent was to find out how well the practices were implemented and any strengths or weaknesses that needed to be addressed.

Through training and extension programmes, to produce the maximum yield at minimum cost, so as to provide hard currency to the farmers and the country.

Guided by the above, the following questions have been formulated as the research problem:

1. How is adherence to the recommendations of science in Ashur area of the Sharqat District in the cultivation of sesame and crop management?
2. For each of the following variables (age, level of education, years of sesame cultivation and sources of information), what is the correlation between the variables and the level of application of scientific recommendations for sesame cultivation and crop management?
3. What are the issues that the farmers are facing in Ashur Subdistrict of Sharqat District with respect to their sesame farming?

1.1. Research Objectives:

1. To find out the frequency of application/implementing scientific practices of cultivation and crop management of sesame in the Ashur Subdistrict—Sharqat District in general.
2. To determine the correlation between the application of the scientific recommendations in cultivating sesame of the farmers in the Ashur Subdistrict - Sharqat District with each of the following independent variables (age, education, years grown sesame, and sources of information).
3. To assess the degree of problems encountered by the sesame farmers in Ashur Subdistrict—Sharqat District.

1.2. Research Hypotheses:

1. The level of application of scientific recommendations in sesame cultivation in Ashur Subdistrict-Sharqat District is not significantly correlated with age.

2. The level of application of scientific recommendations for sesame cultivation in Ashur Subdistrict—Sharqat District is not significantly correlated with the level of education.
3. The level of application scientific recommendations in sesame cultivation in Ashur Subdistrict-Sharqat district in the community doesn't show any statistical relation with the years of cultivation of sesame.
4. At Ashur Subdistrict of Sharqat District, there is no statistically significant correlation between the level of application of the scientific recommendations during the cultivation of sesame and the sources of information.

1.3. Operational Definitions:

1. *Level of Adherence*: This is based on practical indicators of the level of farmers' adherence to the recommendations and practices that the General Authority for Agricultural Extension and Cooperation introduced on sesame cultivation, and that strive to achieve better yields and quality of the crop.
2. *Scientific Recommendations*: The findings of scientific research and recommendations from the rural extension services, which are delivered to the sesame growers via one of the extension communication channels, with the objective of boosting production and enhancing crop quality.

2. Materials and Methods

- 2.1. *Research Methodology*: In this study the descriptive method was used to obtain the research results. It is one of its features to give factual information that will enable researchers to interpret human and social phenomena [6] as cited in [7].
- 2.2. *Research Area*: The research area was the Ashur subdistrict in Sharqat district in Salah al-Din Governorate, because there are a number of farmers of this crop who still use some traditional methods of growing and caring of the crop [8].
- 2.3. *Research Population and Sample*: A statistical population must be carefully delineated, that is, the totality of units aimed at the study has a characteristic that can be studied and generalized [9]. Thus, the research population consisted of all the farmers of sesame (52) farmers.
- 2.4. *Research Tool*: Questionnaire was used and this was regarded as one of the most important tools to obtain accurate information related to agricultural condition and realities [10]. The literature review, previous studies, and research relevant to the current study was used to design the questionnaire. It had two components, namely:
 - A. **Part One**: It contained some questions to gather data on the independent variables associated with the study participants namely age, education level, years of cultivating sesame, sources of information and involvement in extension activities.
 - B. **Part Two**: A preliminary scale was developed which includes six domains, each with a number of questions that correspond with recommendations in the scientific field of sesame cultivation and crop management. The 15 scientific recommendations were spread over the scientific fields as displayed in Table 1.

Table 1. Shows the areas of research

T	Field	Number of paragraphs
1	Plowing and preparing the land	2
2	seeds	2
3	Irrigation	3
4	fertilization	2
5	pest control	4
6	harvest	2
	Total	15

2.4.1. Independent variables are measured using the following methods:Independent variables are measured as following [11, 12, 13]:

- 1) Age (in years): Age of respondents when data was collected.
- 2) Educational attainment: This was measured using the following categories (illiterate, can read and write, elementary school, middle school, preparatory school, technical institute, college, graduate degree) with weights of (1, 2, 3, 4, 5, 6, 7, 8), respectively.
- 3) Number of years involved in sesame cultivation: This was determined by the number of years respondent had been involved in sesame cultivation.
- 4) Sources of information: This was assessed by five sources that could provide information.

2.4.2. Measurement of the dependent variable: The knowledge of the cultivators about sesame cultivation was assessed by using a (15) questions scale scaling out a scientific recommendation which was distributed across the research areas of crop cultivation and management. Three alternatives were given (one correct and two incorrect) for each question. The values corresponding to the level of knowledge range from 1 to 15 points: One point will be given for a correct answer and no point will be given for an incorrect one.

2.4.3. Measurement of Obstacles: The problems were quantified by (8) statements each of which represent a problem that might occur during sesame cultivation in the study area. Respondents were then given the following choices (severe, moderate, minor, slight, none) with scores of (4, 3, 2, 1, 0). Analysis of data and obtaining accurate and scientifically valid results that can be generalized were carried out by the SPSS program, Statistical methods. Data was analyzed with the SPSS program that gave accurate and scientifically valid results, which can be generalized according to [14].

3. Results and Discussion

Objective 1: *To find out how much scientific recommendations for sesame cultivation and crop management in general are being adopted by the sesame farmers of Ashur sub-district of Sharqat district.*

Research results revealed that lowest score is indicating the level of knowledge of the sesame farmers was (4), highest score was (15) and the average of the farmers' knowledge of sesame was (81). The respondents were categorized in three ranges according to the score range and results are reflected in Table 2.

Table 2. Shows the distribution of the study participants by overall level of knowledge

Categories	Number	Percentage %	Average knowledge
Low (10–30)	15	%28.84	25.48
Middle (31–41)	25	%48.08	33
High (42– 52)	12	%23.08	22.52
Total	52	100%	
Mean = 81		SD Deviation = 5.87	

The findings of the study indicated that the majority of the respondents had an average level of knowledge which is slightly on the lower end since 61.84% of the respondents fell in the 'average' and 'low' categories as shown in Table 2. This could be attributed to low number of guidance activities and training courses in the study area [15, 16, 17].

Objective Two: To find the correlation between the level of knowledge of the farmers of sesame crops and each of the following independent factors:

1. **Age:** The ages of the participants were between (18–58) year By arithmetic mean (42.5) The respondentTs were divided into three categories using the range, and the results were as shown in Table 3.

Table 3. Distribution of respondents according to their Ages.

T	Categories	Number	Percentage %	Average knowledge	valuer
1	Young children (18–31) year	20	40 %	28	0.79-
2	Middle-aged32–45) year	22	30 %	22	
3	Elderly (46-58)	10	30 %	31	
	Total	52		100%	

** Significant at the (0.01) level

Table 3. Indicates that less value of the knowledge level average is in the third category. (The elderly) and have reached (11.6) to determine the correlation between the two variables, Pearson's law was used, where it was found that the value of the correlation coefficient (79- 0. This may be because large farmers do not have knowledge of the modern scientific recommendations in the cultivation and service of sesame crops, and they depend on their own traditional experiences in cultivation and service operations in the crop.

2. **Academic achievement:** The subjects were categorized based on their highest educational qualification and it was observed that none of the subjects had any higher qualification. The results were as shown in Table 4.

Table 4. Distribution of respondents according to Educational achievement.

Categories	Number	Percentage %	Average knowledge	values
Illiterat	2	%3.84	12.5	0.53
Reads and Writes	12	%23.08	22.85	
Elementary	6	11.54%	32.87	
Intermidate	12	23.08%	19.9	
Preparatory	9	%17.30	16.9	
Institute	4	%7.70	38.45	
College	6	%1.92	20.59	
Higher Ccertificate	1	6.66%	4.4	
Total	52		100%	

** Significant at the (0.05) level

From table 4. It is noted that farmers who are illiterate had the lowest level of knowledge average of (4) Spearman's law was used to determine the correlation between the two variables, the farmers' knowledge level and their agricultural production method. The statistical hypothesis that there is not a significant correlation between the level application Farmer Sesame crop: Scientific recommendations related to cultivation and Academic achievement was rejected this may be because farmers with a high level of Academic achievement review the scientific recommendations. Thus, they become able to understand its importance with respect agriculture and service crop Sesame crop in increasing its production both in quantity and quality, reducing costs [18].

3. **Number of years the crop has been grown :** The results indicated that the values obtained indicate the years the crop has been grown and were limited to (3–14 years) with the respondents being grouped into three categories based on the range, and the results were as in Table 5.

Table 5. Distribution of respondents based on the number of years the crop has been grown.

T	Categories	Number	Percentage %	Average knowledge	Value
1	(2–5)	21	% 40.38	22.87	0.69
2	(6–9)	19	% 36.54	32.57	
3	(10–14)	12	% 23.08	25.57	
Total		52		100%	

** Significant at the (0.01) level

Table 5. Indicates that the smallest knowledge level score is in the average category (32.57). Pearson correlation coefficient was used to find the correlation between the two variables, the correlation coefficient was: (0.69). Hence, we reject the statistical hypothesis that There is no significant correlation between the extent to which farmers follow the scientific recommendations for cultivation and care of sesame crop and the number of years they have been cultivating sesame crop. This could be because the farmers have their own experiences, which helps them take in new knowledge about the growing and maintenance of the sesame crop.

4. **Information sources:** The research results showed that the values expressing the extent of connection to information sources were limited to (4–24). The respondents were divided into three categories using the scale, and the results are as shown in the table 6 below.

Table 6. Distribution of the farmers studied based on their association with the information sources.

T	Categories	Number	Percentage %	Average knowledge	valuers
1	(5 - 9)	16	%30.76	11.6	0.12
2	(10 - 14)	28	%53.84	13.7	
3	(15 - more)	8	15.38%	14.57	
Total		30	100%		

The lowest score in the knowledge score was obtained in the first category with (11.6) as shown in Table 6. Spearman's correlation coefficient was used in order to find the relationship between the two variables, and it was found that the correlation coefficient is (0.12). However, the alternative hypothesis is rejected and accepted is the statistical hypothesis: (there is a statistically significant correlation between the level of application of scientific recommendations regarding the cultivation of sesame and their management and sources of information), this could be due to the absence of a reliable source on which the farmers can rely [19].

Objective Three: *To identify the problems and obstacles faced by sesame farmers in the Ashur Subdistrict – Shirqat District.*

The problems encountered by the sesame farmers were ranked based on the arithmetic mean of the problems, which is presented in Table 7. The rank of the problems faced by the research participants in the study area as presented in table (7) is as follows:

Table 7. Ranking of Problems Faced by Sesame Farmers in the Study Area

T	The Problem	Average	Rank
1	Harvesters unavailable Sesame crop	9.5	1
2	Difficulty in obtaining pure seeds from the state	8.4	2
3	Lack of activitiess Rashadiya Private Sesame crop cultivation	7.5	3
4	Dense bush growth in fields Agriculturecrop	6.4	
5	to rise Prices fertilizers	5.6	2
6	The unsuitability of gypsum soils for growing the cropsesame	2	7
7	Delay in receiving the proceeds bycommerce	4.4	4
8	Lack of pesticides in a timely manner	5.5	2

Maximum value = 9.5

Lack of harvesters for sesame crop was the first problem mentioned in Table 7, perhaps because the application of scientific recommendations for pest management was not followed due to the lack of pesticides at the appropriate time. "Lack of timely availability of pesticides" was the last of the problems, which could be attributed to farmers' indifference and/or greater availability of pesticides.

4. Conclusion

The research findings showed that farmers' knowledge level regarding sesame cultivation is average and tends to be low. We conclude from this that farmers need extension activities and training courses to increase their knowledge in the field of sesame cultivation and crop management in the study area. Furthermore, the findings revealed that the lowest level of knowledge in this study was among the older farmers. We conclude from this that there is a lack of attention to this group in the design of extension programs and activities tailored to their nature and cognitive and intellectual levels; alternatively, older farmers may be clinging to traditional customs. Moreover the findings indicated that there was a significant relationship between the knowledge of growing sesame and farmers' involvement in farming activities. From this we can conclude that it is important to provide a variety of activities, training courses, and information to the largest number of farmers growing sesame in the study area. Finally, the findings showed that there were a lot of issues that sesame growers are facing. We conclude from this that the relevant authorities in the Agriculture Division of the Ashur al-Shirqat District are failing to provide the necessary services to farmers.

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