ISSN: 2790-5306 (Print), 2790-5314 (Online)
IRAQI JOURNAL OF AGRICULTURAL RESEARCH - Ministry of Agriculture
Available online at: www.ijarmoa.gov.iq
VOL. 28 NO. (2) 2024
IJAR
IRAQI JOURNAL OF AGRICULTURAL RESEARCH

THE EXTENSION SERVICE QUALITY AND CROP FARMERS' SATISFACTION WITH IT IN TAL AFAR DISTRICT/ NINEVEH GOVERNORATE*

A. M. A. Ahmed[1] **M. H. S. Al-Hamdany[1]**

E-mail: abdulbare967@gmail.com

ABSTRACT

The objectives of the research are to identify the degree of extension service quality and the crop farmers' satisfaction with it in Tal Afar District / Nineveh Governorate, as well as to determine the correlation between the degree of extension service quality and the crop farmers' satisfaction with it and the variable of farmers' readiness for change.

The research included (120) farmers who were randomly selected (17%) out of the total number of crop farmers (708) in Tal Afar district. A questionnaire form was used as a tool to collect data from the respondents to achieve the research objectives. The questionnaire form consisted of (32) items distributed into two aspects. The data was collected in October 2023. The SPSS statistical program was used to present and analyze the results. The research results showed that most (68.4%) of the farmers indicated that the extension service quality is medium. Farmers also had medium satisfaction (70%) with the extension service provided. There is also a strong and positive correlation between the degree of quality and satisfaction of farmers with the extension service provision and the readiness to change on the part of field crop farmers, as the percentage of readiness to change reached 90.88%. The research recommended the necessity of providing agricultural extension service to farmers, especially its quality and satisfaction, because it significantly impacts agricultural development, increasing production, and developing rural society. It is necessary to emphasize the readiness of farmers and what is appropriate to their current situation in their practice of growing field crops, which has an impact and is relevant in providing agricultural extension service, especially its quality, satisfaction and adequate support.

Keywords: quality, extension service, field crops, Nineveh Governorate.

*** A part of MSc. thesis for the first author.**

[1] **College of Agriculture, Tikrit University, Iraq**

- **Received:** March 19, 2024.
- **Accepted:** April 3, 2024.
- **Available online:** December 25, 2024.

INTRODUCTION

Agricultural and rural development is a strategy for developing the social and economic life of rural residents, including increasing job opportunities, raising the level of income, and providing food, housing, health, and education. It is a strategy that works to overcome poverty and achieve a decent life for residents of rural areas [6]. Thus, agricultural and rural development has become a priority in the plans of countries seeking development. This is due to the importance and position that the rural community takes place in comprehensive sustainable development [5]. It has also received great attention from specialists in the field of rural development because it plays a major role in developing the national economy through exploitation and rational investment of the human and natural resources and capabilities available in the countryside [8]. Agricultural extension is one of the communication systems, and indeed the most important change device that contributes to rural development processes [5].

Extension services are the performance of a specific duty or work or meeting a specific need for people, this term refers to the actual performance of a specific work by the principles and foundations of agricultural extension as educational work, and the performance of this work results in fulfilling one or more of the extension requirements [2]. Also, the extension service is a group of interconnected activities that aim to invest resources to obtain certain benefits have a starting point and an endpoint, and seek to achieve certain goals [29]. The extension services quality is the feature through which agricultural progress can be measured, and some have adopted the concept of quality by focusing on the product accordingly, Swailem [26] indicated that quality is a set of overall properties and characteristics that the product or service carries and its suitability to achieve needs and satisfaction, that is, to match its purpose. Tahoun [28] defined it as the degree to which the product conforms to the technical specifications required by the customer's need. Swailem [27] mentioned, it is the degree achieved by the organization in confirming a particular product to the planned standard specifications, which expresses the suitability of the product for use by the customer, who in turn evaluates the product in light of his previous experiences.

Some specialists focused on the beneficiary of the extension service in their definition of quality, El-Shenawy [14] indicated that quality means meeting the needs of the beneficiary and achieving his satisfaction. Quality is also defined as, "the total sum of the characteristics of a good or service resulting from marketing, engineering, manufacturing, and maintenance studies, or the existence of a good or service that meets the expectations of the beneficiary [9]. Also, has been defined it as achieving the characteristics or standards, and the suitability of the elements of the extension service provided through inputs, processes, and outputs, and the basic needs of farmers and society for appropriate and effective agricultural techniques in addressing them, and the problems of their productive, economic, social, natural and environmental agricultural activity - and achieving their satisfaction while preserving the environment [11].

Quality in agricultural extension means creating a regulatory environment in the extension organization that helps workers perform their required work with a distinguished level of performance by the required

specifications [18]. The extension service quality has been defined as superior standards that create a sense of value that matches or exceeds the ideal expectations of the target, as organizations seek high-quality services that satisfy the expectations and needs of stakeholders and targets [22].

In the field of agricultural extension, the researchers define it as a vision and observation through the eyes of the extension administration's targets, who are the employees working in agricultural extension and farmers, and working collaboratively, while working to introduce continuous improvements to the inputs, processes and outputs of the extension organization to achieve the satisfaction of the needs of the targets. The elements of quality mentioned by Najm [25] are the strategic vision for quality, continuous improvement, focus on the target, obligating and empowering employees, and calibration. The success of the extension process depends to a large extent on the competence and experience of its workers. The role that agricultural extension workers play in light of the activities and job tasks that they carry out makes them face many problems and obstacles that vary in severity and range from ease to complexity in the extension service provided by the extension system [12]. Al-Najjar et al. [7] see the need to integrate and unify service quality standards and indicators for evaluation by the targets, which are (reliability, responsiveness, trust and safety, and tangibility).

Abdul Mahdi [1] reported that the respondents consider the importance to the standards that should be met in the agricultural extension service provided to them, and this confirms the adoption of their approval in the preparation of future agricultural extension activities and programs as an expression of their quality. Ganpat et al. study [15] revealed that there is modest satisfaction with the extension service in the Organization of Eastern Caribbean States (OECS), as farmers were dissatisfied with several main areas and their reactions reflected that. The results of the research also showed that farmer groups provide. The opportunity to create alternative opinions to the guidance service, the organization recommended taking measures to improve the image and level of the extension service among farmers.

The researchers believe that the concept of quality in this study is an evolution to include processes and functions and that it does not come from space, but rather through the acquisition of various sciences like humanities, nature, and statistics sciences...etc. Although there are many definitions of quality, they have several things in common, including quality is viewed from different points of view. Quality for managers means adherence to standards and instructions, and for the beneficiary, quality means satisfying needs and achieving satisfaction. Linking the definition of quality to inputs, processes, and outputs. Quality is a management philosophy that means continuous improvement. Quality means doing the right work in the right way from the first glance. Quality strives to unify efforts and invest energies collectively different.

Field crops play an essential role in ensuring food security for human beings. It is necessary to provide them with appropriate quality services to develope field crops, which are defined as field crops, are every annual herbaceous plant that is grown in the field in relatively large areas to obtain fruits, seeds, or seeds from it. Roots, stems, or any other part of the plant are used by humans for specific purposes (except for horticultural crops and vegetable crops) [16]. El-Desouki [19] defined it as any herbaceous plant that is

cultivated on a large scale. What is meant by an herbaceous plant is that it is not a tree or a shrub, although some field crops may deviate from this rule, such as cotton, which is originally considered a shrub, it is treated like an herbaceous plant during its cultivation.

The cultivation of any crop depends on the nature of the prevailing climate in the area of its cultivation, despite the importance of natural and human factors. The climate determines the quality of crops, their planting dates, stages of growth and maturity, the composition of agricultural soil, and the diversity of water resources. Thus it is a major factor in the success or failure of agriculture [3].

It can be said that the basic step that must be followed when achieving food security at present and in the future is to expand the cultivation and production of grain crops to provide a loaf of bread and fill the food gap. Therefore, work must be done to increase the production of these crops, as some grain crops such as wheat lead to a strategic role in the policies of some countries that exert pressure on other importing countries that are not self-sufficient. Likewise, the cultivation of grain crops has a relatively large economic return, as it produces a large crop of grains with a small number of seeds, and a high yield of these crops can be obtained with a little effort, service, and care [19].

Through the above and the researchers' knowledge of the reality of the study area about the extension services quality and their satisfaction with them in the aspect of field crops, it became necessary to identify these urgent problems in the research area. The idea of the study came to answer the following research questions:

1-What is the degree of extension service quality in Tal Afar District/Nineveh Governorate?

2-What is the degree of farmers' crop satisfaction in Tal Afar District/Nineveh Governorate?

3-What is the order of the two research fields in descending order according to the percentage weight of each field?

4-Is there a significant correlation between the degree of the extension service quality and farmers' readiness to change in Tal Afar District/Nineveh Governorate?

Objectives of Research

1- Identifying the degree of extension service quality in Tal Afar District/Nineveh Governorate.

2- Identifying the degree of crop farmers' satisfaction in Tal Afar District/Nineveh Governorate.

3- Identify dependent variables' aspects in descending order according to the percentage weight of each aspect.

4- Determine the correlation between the degree of the extension service quality and farmers' readiness to change in Tal Afar District/Nineveh Governorate.

Research Hypothesis

There is no correlation between the degree of the extension service quality and the satisfaction of field crop growers with it in Tal Afar District/ Nineveh Governorate and the variable of willingness to change on the part of the farmers.

Methodology

The descriptive approach was used to achieve the research objectives by studying the phenomenon and collecting data, which helps to describe the phenomenon accurately to extract its implications and reach comprehensive results [10].

Population and Sampling Procedure

All lists of crop farmers with their numbers were obtained from the district agriculture office which was divided into two divisions, first one included (452) farmers, while the second division included (256) farmers, thus the total number of farmers was (708) farmers, according to the records of the district agricultural office in Tal Afar district 2023. A 17% random sample was selected, bringing the number of respondents who underwent research procedures to (120) respondents.

Data Collection tool

The questionnaire was used in the procedures of this research, as the questionnaire is an appropriate tool for obtaining information, data, and facts, and because it gives more objective data than other data collection methods to achieve the research objectives [23]. Data were collected through the survey method using a pre-tested and validated questionnaire included two parts, The first part: contains the degree of extension service quality included (19) items The second part: contains the degree of crop farmers' satisfaction included (13) items. Likert scale each item in a three-point was used to measure the degree of extension service, The scale used was 3= very agree, 2= agree, 1= disagree. The farmers' readiness to change was measured by (10) items using a Likert scale of three points also as mentioned above.

Validity test

Validity means measuring what is intended to be measured and does not measure something else [23]. The validity of the scale means that the scale measures what it is supposed to measure, i.e. the extent to which the scale achieves the goal for which it was developed, and this is what is considered face validity [21]. To verify the face validity and content validity, the questionnaire was presented to (16) experts in the field of agricultural extension.

Reliability test

The preliminary test (Pre-test) was conducted on a group of field crop growers in October 2023 on a random sample of (30) respondents from the research community outside the sample in the Tal Afar district of Nineveh Governorate. The value of the Cronbach's alpha coefficient was 0.83, and the validity coefficient was 0.91. The aim of conducting the initial test was to verify the clarity of the paragraphs and questions, diagnose and address areas of difficulty, and the time taken by the respondent to answer the paragraphs, as consistency is considered part of honesty because the true test or scale is the one that measures what it seeks to measure accurately and consistently [6]. Cronbach's alpha coefficient was used to indicate the scale's reliability, and Cronbach's alpha is one of the methods of reliability of scales [13].

RESULTS AND DISCUSSION

1- Identify the degree of extension service quality in Tal Afar District/Nineveh Governorate.

The results of the research showed that the lowest value in the aspect of extension service quality was 19 degrees, and the highest value was 51 degrees, with an average of 33.58 degrees with a standard deviation of 3.876. The respondents were divided into three categories using the range law, the highest percentage of the respondents was within the medium category, as shown in Table 1.

Table 1:Distribution of respondents according to categories in the aspect of extension services quality.

S	Categories of extension service	Number	%	The average degree of service
1	Low (19-29)	25	20.8	27.00
2	Medium (30-40)	82	68.4	33.89
3	High (More than 40)	13	10.8	44.31
the total		120	%100	SD=13.76

Table 1 revealed that most (68.4%) of the respondents were in the medium category, while the lowest (10.8%) of them were in the high category. Therefore, the level of extension services quality is described as fair tends to decline. The reason for this result may be due to extension services were not as the farmers expected. Extension services may not deal with the agricultural aspect that farmers wish to obtain extension information about it, or may not have used the appropriate extension methods and tools for the respondents.

2- Identifying the degree of farmers' satisfaction with extension services in Tal Afar District/Nineveh Governorate.

The results of the research showed that the lowest value in the aspect of extension service level was 13 degrees and the highest value was 35 degrees, with an average of 22.70 degrees with a standard deviation of 4.11. The respondents were divided into three categories using the range law, and the highest percentage of respondents was within the medium category, as shown in Table 2.

Table 2: Distribution of respondents according to categories of farmers' satisfaction with extension services

S	Categories of extension service	Number	%	The average degree of service
1	Low (13-19)	20	16.6	16.70
2	Medium (20-26)	84	70.0	22.82
3	High (more than 26)	16	13.4	29.56
the total		120	100	SD=4.11

Table 2 shows that most (70%) of the respondents were in the medium category, while the lowest (13.4) category. Therefore, the level of extension services is described as fair tends to decline. The reason for this result may be due to the farmers' satisfaction with extension services increases when those services meet their cognitive and applied needs, it should be implemented at the beginning of the wheat crop season, and it should use extension methods that are understood by the respondents.

3- Arrange research aspects in descending order according to the percent weight. The research results showed rapprochement percent weights for the research aspects, as shown in Table 3.

Table 3: Descending order of research fields according to percentage weight

S	Fields	Average	Maximum value	The percent weight	Rank
1	Extension services quality	33.58	57	58.912	1
2	farmers' satisfaction with extension services	22.70	39	58.205	2

Table 3 shows that the aspect of extension services quality ranked first.

4- The correlation between the extension service quality degree and farmers' readiness for change in Tal Afar District / Nineveh Governorate.

The results showed that the lowest value of farmers' readiness for change was 14 degrees and the largest value was 29 degrees, with a mean of 23.60 degrees and a standard deviation of 3.46. The respondents were distributed into three categories using the range law, and it appeared that most (62%) of respondents were in the high category, as shown in Table 4.

Table 4: Distribution of respondents according to the categories of the readiness for change variable

S	Readiness categories	number	%	The average extension service quality	r value	t value	Sig.
1	Low (14-18)	17	14.2	79.35	0.325**	3.721	Sig.
2	Medium (19-23)	28	23.3	87.36			
3	High (24- 29)	75	62.5	90.88			
The total		120	100	**Significant at 0.01 probability level			

To find the correlation between the extension service quality and farmers' readiness for change, the Pearson correlation coefficient was used, which had a value of 0.325, indicating a positive relationship between the two variables. To test the significance of the relationship, a t-test was used, whose calculated value was 3.721, which is higher than the tabular t value at the level of the probability is 0.01, with a value of 2.358. This indicates the existence of a positive significant correlation between the two variables at the probability level of 0.01. Thus, the null hypothesis is rejected and the alternative hypothesis is accepted, which states (there is a significant correlation between the two variables). This may result from the extension services provided and activities such as extension symposiums and workshops that were not at the required level.

Conclusions

1- It is concluded from the respondents' responses that the degree of extension service quality was at an average level of 68.4%. This result indicates that the extension services quality and extension activities implemented in the study area are unsuitable for farmers.

2- It can be concluded from the respondents' responses that their level of satisfaction with the extension service was at a fair level, 68.4%.

3- It is concluded that there is a correlation between the dependent variable, the level of extension service quality, and the independent variable, the farmers' readiness for change on the part of the farmers, which had a clear effect. That is, the higher the level of extension service quality and farmers'

satisfaction, the more there is a connection between the two variables, and this has a major role in change and readiness for the respondents.

Recommendations

1-The necessity of providing agricultural extension services with high quality to farmers, because it has a significant impact on agricultural development, increasing production, and rural society development.

2-The need to strengthen farmers' satisfaction with extension services provided by providing improved information about seeds, pesticides, and chemical fertilizers, as well as providing information about tools that are used to protect field crops.

3- It is necessary to emphasize the extent of farmers' readiness and what is appropriate to their current situation in their practice of crop farmers, which has an impact and is relevant in providing agricultural extension service, especially its quality and satisfaction with it, through holding symposiums and workshops on the role of field crops, as well as training courses for farmers by the Agricultural Extension Office.

4- Encouraging and organizing farmer groups, and making them understand group dynamics. At the same time, farmers need to be re-educated to make them understand this new approach instead of the traditional approach and strive to adopt it as the approach that will bring them a better level of service in general. As well as determining the objectives of priority extension activities and approaches to new programmers, and training employees to enable them to provide farmers with up-to-date information and keep pace with developments in modern technology.

REFERENCE

1-Abdul M.; F. Saadoun (2021). A proposed vision for the quality of extension service for vegetable growers in Baghdad Governorate from their point of view, Master's thesis, Department of Extension and Transfer of Agricultural Engineering Technologies, College of Agricultural Engineering Sciences, University of Baghdad., 54.

2-Al-Ani, B. R. Kh. (2006). Exposing farmers to some extension methods and means and activating their use in the field, Master's thesis, University of Baghdad, College of Agriculture, Department of Extension and Transfer of Agricultural Technologies., 3.

3-Al-Ansari, M. M.; A. H. Ah. Al-Younis; Ghanem Saad Allah Hawi, Wafqi Shaker Al-Shamaa (2011). Theoretical Principles of Field Crops, second edition, Dar Ibn Al-Atheer for Printing and Publishing, University of Mosul. Agro-lib. Site/2022/11/blog -Post_382.html. 2.

4-Ali, B. Sh. and B. Amer (2017). The National Agricultural Development Plan and its Impact on Rural Development, Master's thesis, Faculty of Law, Science and Political Affairs, Zian Ashour University in Djelfa., 2.

5-Al-Hamdany, M. H. S. (2013). Determinants of the administrative behavior of agricultural extension managers at the administrative levels of the agricultural extension organization in the Republic of Iraq, Ph.D. thesis, Cairo University, Faculty of Agriculture, Department of Sociology and Agricultural Extension., 61.

6-Al-Jadri, A. H. (2018). The Guide to Preparing and Writing University Dissertations and Theses, 1st edition, Amman, Jordan, 92.
7-Al-Najjar, S. M. and M. Kamel, Quality and Environment Management, Principles and Applications, first edition, Al-Sisban Library, Baghdad, Iraq., 59.
8-Al-Nour, M. Ah. M. (2012). Rural Development, Security and Life Magazine, Issue 365, Sudan University, 53.
9-Al-Qar'an, Ah. M. (2004). Developing a model to measure the degree of implementation of total quality management in Jordanian units in Jordanian universities, unpublished master's thesis, Amman University for Postgraduate Studies, College of Education., 164.
10-Al-Rashidi, B. S. (2002). Educational Research Methods, College of Education, Kuwait University, 1st edition, Dar Al-Kutub Al-Hadeeth., 16.
11-Al-Taie, H. Kh. (2005). Good Management of Technology Transfer, Iraqi Agriculture Journal, Issue 2, 17.
12-Al-Tanoubi, M. M. Omar (1998). Agricultural Extension Reference, Omar Al-Mukhtar University, College of Agriculture, Great Libyan Jamahiriya, Arab Renaissance House for Printing and Publishing., 23.
13-Al-Sammak, M. A. S. (2019). Scientific Research Methods, Foundations and Applications, Al-Yazouri Scientific Publishing and Distribution House, Jordan, Amman, 149.
14-El-Shenawy, L. H. (2009). "The Quality of Research in Agricultural Extension... A Future Vision", Ninth Conference of the Scientific Society for Agricultural Extension, Scientific Society for Agricultural Extension, 5.
15-Ganpat, W. G.; N. Webster and L. Narine (2014). Farmers' satisfaction with extension services in the Organization of Eastern Caribbean States. Journal of International Agricultural and Extension Education, Volume 21, Issue 3: 49-62.
16-Hassanein, A. H. M. (2019). Grain Crop Production, 1st edition, Al-Azhar University, College of Agriculture., 7.
17-Hassanein, A. H. M.; M. Al-Asmar Al-Hawari and F. Saafan (2021). Basics of field crop production, Al-Azhar University, College of Agriculture., 9.
18-Hilal, M. Abdel-Ghani Hassan (2011). "Total Quality Management Skills in Counseling," Performance and Development Center, first edition, 41.
19-Ibrahim, M. El-Desouki (2022). Crop Production, Menoufia University, Faculty of Agriculture. 17.
20-Jern, Kh. (2007). Extension and its importance in improving the quality of agricultural products, Regional Workshop Report, Afro-Asian Rural Development Organization (ARDO), Amman, Jordan., 41.
21-Kawafha, T. M. (2010). Measurement, Evaluation, and Methods of Measurement and Diagnosis in Special Education, 3rd edition, Dar Al-Masirah for Publishing and Distribution, Amman, Jordan., 110.
22-Landini, F. (2020). What does 'quality mean in the context of rural extension and advisory services? Agronomla Colombiana, 38(1):141.
23-Melhem, S. M. (2010). Measurement and Evaluation in Education and Psychology, 2nd edition, Dar Al-Maysara for Publishing and Distribution, Amman, Jordan, 317.

24-Melhem, S. M. (2011). Measurement and Evaluation in Education and Psychology, 5th edition, Dar Al-Masirah for Publishing, Distribution and Printing, Amman, Jordan, 27.

25-Najm, A. N. (2013). Introduction to Project Management, Dar Al-Warraq for Publishing and Distribution, Al-Zaytoonah University, Jordan., 266.

26-Sweilem, M. N. Ali (2003). "Twin Efficiency and Effectiveness," Egypt Scientific Services, 124.

27-Swailem, M. N. Ali (2015). "Selected Information in Agricultural Extension and Rural Society," Dar Al-Nada Printing., 159.

28-Tahoun, Z. (2010)."Production and Operations Management with Total Quality", Jado Cairo Office, 154.

29-Youssef, M(2001). Preparing and Evaluating Agricultural Projects, Arab Organization for Agricultural Development, Egypt, Report, 1.

ISSN: 2790-5306 (Print), 2790-5314(Online)
مجلة الزراعة العراقية البحثية - وزارة الزراعة
متاح على الانترنت: www.ijarmoa.gov.iq
مجلد 28 العدد (2) 2024
IJAR
IRAQI JOURNAL OF AGRICULTURAL RESEARCH

جودة الخدمة الإرشادية ورضا زراع المحاصيل الحقلية عنها في قضاء تلعفر/محافظة نينوى*

عبد الباري محمد علي أحمد[1] مجيد هادي صالح الحمداني[1]
E-mail: abdulbare967@gmail.com

الملخص

استهدف البحث التعرف على درجة جودة الخدمة الإرشادية ورضا زراع المحاصيل الحقلية عنها في قضاء تلعفر/محافظة نينوى، وكذلك تحديد العلاقة الارتباطية بين كل من درجة جودة الخدمة الإرشادية ورضا مزراعي المحاصيل الحقلية عنها وبين متغير استعداد المزارعين للتغيير .

شمل البحث (120) مزارعاً تم اختيارهم عشوائيا بنسبة (17%) من مجموع مزارعي المحاصيل الحقلية البالغ عددهم (708) مزارعاً في قضاء تلعفر. استخدامت استمارة الاستبيان كأداة للحصول على البيانات اللازمة من المبحوثين لتحقيق اهداف البحث، تكونت استمارة الاستبيان من (32) فقرة موزعة على مجالين، جمعت البيانات في تشرين اول2023. واستخدم البرنامج الإحصائي spss في عرض وتحليل النتائج.

اظهرت نتائج البحث أن اغلبية المبحوثين (68.4%) اشاروا الى ان جودة الخدمة الارشادية كانت متوسطة، في حين عبر 70.0% من المبحوثين عن رضاهم عن الخدمة الارشادية المقدمة لهم. ووجد ان هناك علاقة ارتباطية معنوية موجبة بين درجة جودة تقديم الخدمة الارشادية عنها وبين استعداد مزارعي المحاصيل الحقلية للتغيير،أذ بلغت نسبة استعداد المبحوثين للتغيير90.88%. وأوصى البحث ضرورة تحسين الخدمة الإرشادية الزراعية المقدمة للمزارعين من اجل ان تنال رضا المزارعين، وذلك لما لها إثر كبير في التطور الزراعي وزيادة الإنتاج وتنمية المجتمع الريفي، وكذلك ضرورة الاهتمام من قبل الجهات ذات العلاقة على تطوير المزارعين في مجال استعدادهم لتبني الخدمات الإرشادية من خلال توفير المستلزمات والدعم الكافي الذي يساعدهم في ممارسة زراعة المحاصيل الحقلية.

الكلمات الدالة: جودة، الخدمة الإرشادية، المحاصيل الحقلية، محافظة نينوى.

---

* جزء من رسالة ماجستير للباحث الاول.

[1] كلية الزراعة ، جامعة تكريت، صلاح الدين، العراق.

- تاريخ تسلم البحث: 19/ اذار/2024.
- تاريخ قبول البحث: 3/ نيسان/2024.
- متاح على الانترنت: 25/كانون اول/2024.