

Improving the Performance of the Agricultural Innovation System in Responding Effectively to the Challenges of Corn Farmers in Babylon Governorate

Samer Muhi Taha and Bayan Abdul-Jabbar Ridha

College of Agricultural Engineering Sciences/ University of Baghdad/ Republic of Iraq.

. Corresponding author Email: samer.muhi2209@coagri.uobaghdad.edu.iq

DOI: <https://doi.org/10.36077/kjas/2025/v17i3.13474>

Received date: 29/9 /2023

Accepted date: 6/ 12/2023

Abstract

The research seek to improve the performance of the agricultural innovation system in responding effectively to the challenges of corn farmers in Babylon Governorate by determine the improving the performance of the agricultural innovation system in responding effectively to the challenges of corn farmers in Babylon governorate in general , The correlation between the variable in research , arranging fields to improve the performance of the agricultural innovation system and arranging the items of each of its fields. To achieve the research objectives, a questionnaire was developed based on relevant literature, previous studies, and expert opinions. The questionnaire consisted of 48 items divided into 4 fields: the conceptual framework of the agricultural innovation system, the agricultural innovation system plan, the organization of the agricultural innovation system, and agricultural laws. The research population included all workers in the agricultural innovation system, totaling 104 respondents, including 92 managers and 12 researchers. Data was collected through the questionnaire and personal interviews conducted between November 14, 2022, and January 29, 2023. The research findings indicated that the proposed items related to the conceptual framework of the agricultural innovation system ranked first with a weighted mean of 4.74, representing 94.88% of the total weightage. On the other hand, the proposed items concerning agricultural laws ranked last with a weighted mean of 4.05, representing 80.94% of the total weightage. Additionally, there was a convergence in the weighted means across the fields related to the proposed solutions for enhancing the performance of the agricultural innovation system.

Keywords: performance improvement, agricultural innovation system, corn crop.



Introduction

Agricultural sector leads a prominent activity in the economies of countries as the main source in providing foodstuffs to all developed and developing countries of the world alike (1), and that one of the most important sources of food is cereal crops because they contain basic and important elements for human life alike, and that one of the most important of these crops is corn, which constitutes the first crop in obtaining proteins compared to other crops, as it is ranked third after wheat and barley in terms of cultivated field. and productivity and nutritional value(2) and used its residues to improve soil properties and improve the productivity of cultivated crops enhancing the sustainability of the farming system of the rural household (3), as well as its use as animal feed (4).

Despite the endeavors of the government and relevant authorities, the production and productivity of corn crops remain insufficient, as indicated by the decline in statistics. The cultivated fields recorded a decrease from 478 dunums in 2019 to 325 dunums in 2022. Similarly, the production dropped from 633 tons to 374 tons during the same period. Consequently, the productivity figures for those years were 134 kg/dunum and 114 kg/dunum, respectively (5).

The decline in corn crop productivity can be attributed to factors such as the agricultural innovation system, which plays a vital role in sustainable agriculture and food security in developing countries, including Iraq (6). This system aims to improve productivity, enhance farmers' knowledge and skills, preserve natural resources, and improve economic and

social conditions in accordance with international agricultural standards (7). However, the absence or poor performance of the agricultural innovation system negatively impacts corn crop production and productivity.

Studies conducted in Iraq have highlighted the negative effects of the system's weak performance. Inadequate marketing functions result in insufficient quantities being marketed and significant crop losses (8). The lack of processed corn varieties further decreases productivity and production per acre (9). Weak agricultural extension activities related to corn cultivation also contribute to decreased crop productivity (10). Additionally, insufficient environmental extension activities fail to warn farmers about the risks of using fuel residues, which can lead to the accumulation of harmful heavy metal elements in the soil, posing risks to humans, animals, and plants (11, 12).

In the Governorate of Babylon, the picture of the level of performance of the agricultural the performance of the agricultural innovation system in the specific context mentioned does not differ significantly from the system's overall performance in the country. The reality reveals a general weakness in the system's performance. for example, but not limited to the weakness in the role of Governorate companies in the processing of agricultural supplies, especially with regard to the varieties of seeds of the corn crop and chemical fertilizers (13), and the presence of losses of the marketed corn yield, as its losses are estimated 34 thousand tons resulted from this The loss is estimated at

10 billion dinars (14), the weakness of financial financing and the large number of routine procedures, which reduced the opportunities to benefit from agricultural loans and advances granted to Governorate agricultural departments (15), and many studies and scientific research indicated a weakness in the agricultural extension service provided to corn farmers in Babylon Governorate (16, 17 and 18).

Based on the To address these obstacles it has become necessary to improve the performance of the agricultural innovation system as an important input and method in responding effectively to meet the challenges of corn farmers, so this research came to raise the following question:

- What are Determine the Improving the Performance of the Agricultural Innovation System in Responding Effectively to the Challenges of Corn Farmers in Babylon Governorate in general?
- What The correlation between the variable in research?
- What are the items of each field of improving the performance of the agricultural innovation system?
- What are the items of each field of improving the performance of the agricultural innovation system, represented in the following fields: (conceptual framework of the agricultural innovation system, agricultural innovation system plan, and organization of the agricultural innovation system, agricultural laws)?

Research objectives:

1-Determine the Improving the Performance of the Agricultural Innovation System in Responding Effectively to the

Challenges of Corn Farmers in Babylon Governorate in general.

2-The correlation between the variable in research.

3-Arranging the fields of proposed solutions to improve the performance of the agricultural innovation system.

4-Arranging the items of each field of improving the performance of the agricultural innovation system, represented in the following fields: (conceptual framework of the agricultural innovation system, agricultural innovation system plan, and organization of the agricultural innovation system, agricultural laws).

Research Hypothesis: There is a substantial level of consensus among respondents, including managers and researchers, regarding the suggested solutions for improving the performance of the agricultural innovation system to effectively tackle the challenges experienced by corn farmers in Babylon Governorate.

Material and Methods

Research methodology: In order to achieve the objectives of the research, use the descriptive method, which is one of the research methods that deal with events, phenomena and practices that exist and were available for research and measurement as they are without the intervention of the researcher in their events (19).

Research Population: It included all workers in the agricultural innovation system, which numbered 121 respondents distributed between 102 managers and 19 researchers.

Research sample: All workers in the agricultural innovation system numbering 104 respondents distributed between 92 managers and 12 researchers.

Data collection tool: The questionnaire was adopted and the personal interview method as a tool to collect data from respondents (managers and researchers). The preparation of the questionnaire went through a series of stages:

1- Preparing the questionnaire in its initial form: In the light of previous literature and studies in the field of agricultural innovation system and specialists in this field, questionnaire was prepared for workers (managers and researchers) in the agricultural innovation system, which consisted of 54 items distributed over 4 fields proposed to improve the performance of the agricultural innovation system.

2- Development of the questionnaire: The questionnaire was presented to a group of experts in the field of agricultural extension, numbering 17 experts to indicate the degree of their approval on the fields and items of the questionnaire in the light of the scale of approval consisting of three levels: agree, agree with the amendment, and disagree.

3- Establishing the expert approval criterion (threshold cut) for the questionnaire components: The criterion or threshold cut serves as the basis for determining the inclusion or exclusion of fields and items in the questionnaire. If the expert approval rating for any of the components (fields and items) in the final questionnaire reaches or exceeds 75%, it signifies their survival and inclusion in the questionnaire.

4- Calculating the means of the degree of expert approval on the components of the questionnaire (fields and items): Estimated weights (numerical values) had given to the levels of approval scales as follows: (agree = 2), (agree with amendment = 1), (disagree = zero), and thus the scale degree ranged between (0-2) degrees, and the means calculated by calculating the total degree obtained on the number of experts.

5- Preparation of the questionnaire in its final form: Upon comparing the mean degree of expert approval for the questionnaire components (fields and items) with the determined threshold cut, it has been observed that all fields and items have met or exceeded the threshold cut. The threshold cut for the scale of proposed solutions to improve the performance of the agricultural innovation system reached 88.24%. As a result, 4 items have been removed from the proposed solutions fields. Consequently, the scale now consists of 48 items distributed across 4 fields.

Questionnaire reliability: A preliminary test of the questionnaire was conducted in October 2022 on a sample of managers and researchers in the agricultural innovation system in Babylon Governorate, numbering 1 respondents distributed between 10 managers and 7 researchers, and used to measure the reliability of the scale of obstacles facing the agricultural innovation system, the Alpha Cronbach coefficient, which amounted to 0.83.

Data collection: The research data was collected using the questionnaire and by the personal interview method from a sample of managers and researchers numbering (104) respondents during the

period between November 14, 2022, and January 29, 2023.

Tabulation and analysis of data: weights (5, 4, 3, 2, 1) had given to the scale levels of the proposed solutions to improve the performance of the agricultural innovation system (very agree, agree, neutral, disagree, very disagree) respectively, and to arrange the fields and items according to their importance from the point of view of managers and researchers, they were arranged in descending order according to the weighted mean and percentage weight.

Statistical methods: The statistical methods used in the analysis of research data are the Alpha Cronbach and the weighted mean and percentage weight.

Results and Discussion

1-Determine the Improving the Performance of the Agricultural

Innovation System in Responding Effectively to the Challenges of Corn Farmers in Babylon Governorate in general

The research results showed that the highest percentage 61.54 % The proposed solutions to improve the performance of the agricultural innovation system within Agree, followed by 21.15 % The proposed solutions to improve the performance of the agricultural innovation system within very agree and 7.69% The proposed solutions to improve the performance of the agricultural innovation system within not agree, and 5.77% the proposed solutions to improve the performance of the agricultural innovation system within neutral, and the lowest percentage was 3.85% the proposed solutions to improve the performance of the agricultural innovation system within very disagree, as shown in (Figure1).

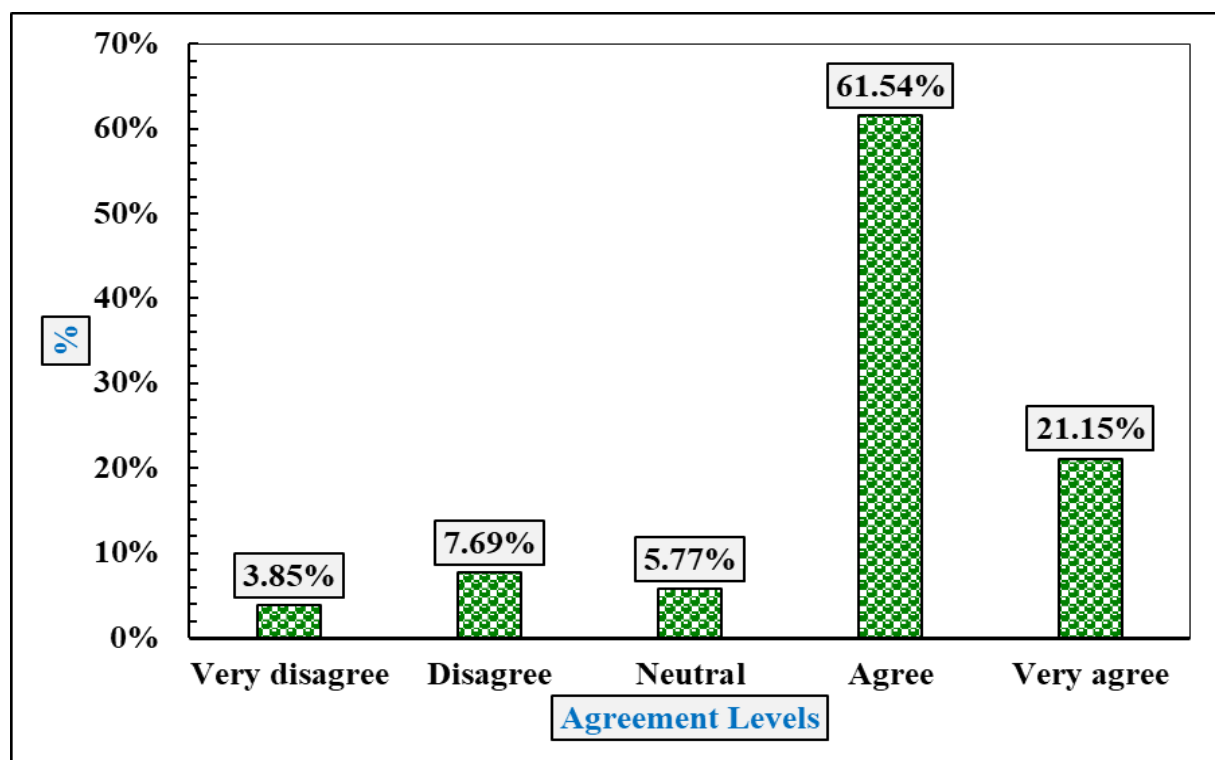


Figure 1. Improving the Performance of the Agricultural Innovation System in Responding Effectively to the Challenges of Corn Farmers in Babylon Governorate in general.

from Figure 1 that the highest percentage (82.69% of the respondents fell within the level of agree to very agree with the proposed solutions to improve the performance of the agricultural innovation system in responding effectively to the challenges of corn farmers in Babylon Governorate, as indicated by the mean (4.27) degree and the percentage weight (85.4%) score, for several reasons, including that The researchers stress that the importance of having a clear vision of the concept of the agricultural innovation system for workers in the system enables the components (parties)the innovation system provides its services to the beneficiary entities by providing an integrated package of material and financial human resources and following up on the beneficiary entities' application of the services provided to them and evaluating their results and their satisfaction with those services, as well as benefiting from the report of those results

by the decision maker in the agricultural innovation system, which helps in Formulating the future activities of the components of the agricultural innovation system in a way that is compatible with the nature of the requirements and resources available to them and to achieve their established goals.

2-The correlation between the variable in research

2 - 1- Ages of workers in the agricultural innovation system

The results of the research showed that the highest age of the respondents was (59) years and the lowest age was 25 years, with a mean of 42 years. After classifying the respondents into five age groups, as in (Figure2) , it became clear that a percentage of 66.61% of the respondents were within the age groups. 32 - 38 and 39 - 45, which constitute two-thirds of the respondents.

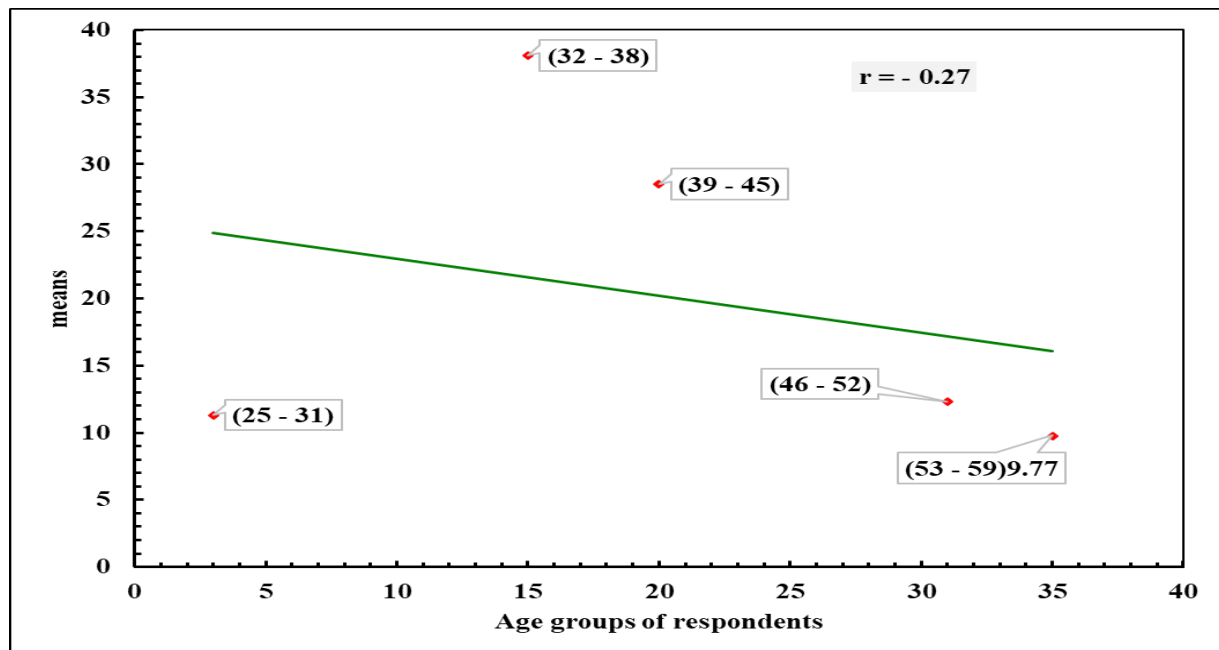


Figure 2. Ages of workers in the agricultural innovation system.

from figure 2 The general age of the respondents is within the age group and youthful energy that enables the system to carry out its duties and tasks as desired and planned currently or in the future, To find the correlation between the level of approval of the respondents and their age, a simple correlation coefficient was used, which reached a value of $r = -0.27$, which shows the existence of a weak and inverse relationship, meaning that the older the respondent gets, the more information and skills he possesses.

2- 2- Educational level of workers in the agricultural innovation system

The results of the research showed that the highest percentage was of bachelor's and postgraduate educational levels, and the lowest educational level was diploma. After classifying the respondents into three categories as shown in (Figure 3), it became clear that a percentage 89.65% were holders of bachelor's and postgraduate degrees, while the diploma represented the lowest percentage. It was 10.35%.

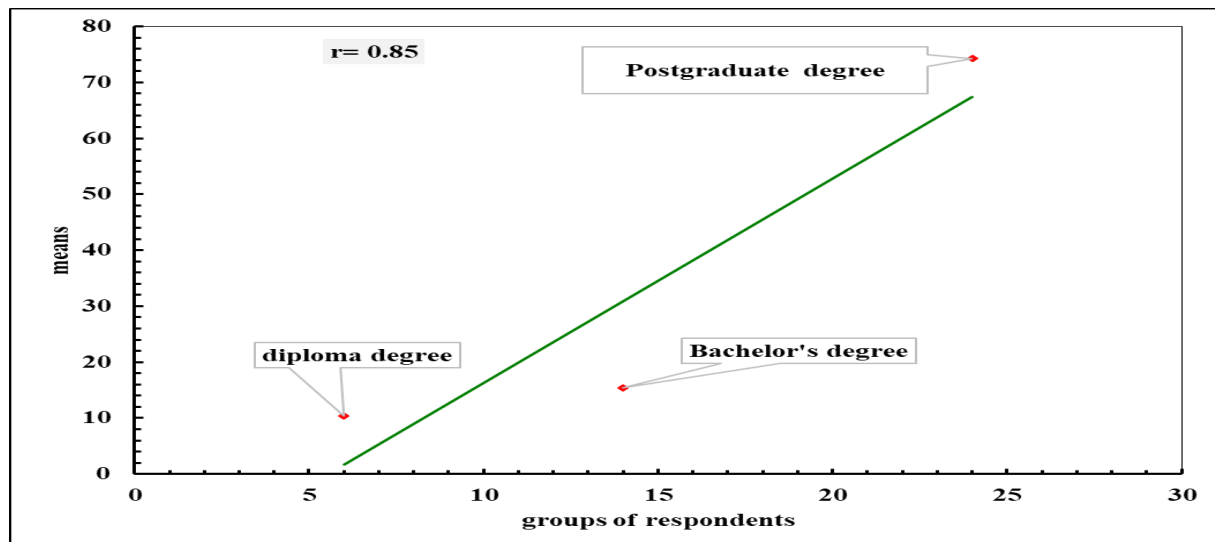


Figure 3. Educational level of workers in the agricultural innovation system.

from figure 3 that a high percentage of workers in the agricultural innovation system have a Postgraduate degree and bachelor's degree, in addition to holding advanced certificates. This gives a positive and effective indication of the possibility of applying, implementing and evaluating the activities of the system as a result of the specialized knowledge and skill qualification they have acquired throughout period of their university studies , To find the correlation between the level of approval of the respondents and their educational level, a simple correlation coefficient was used, which reached a value of 0.85, which shows the existence of a strong and direct relationship, that is, the higher the educational level of the respondent, the

greater his ability to carry out the tasks and duties assigned to them.

2- 3- Number of years of service for workers in the agricultural innovation system

The results of the research showed that the greatest number of years of service for employees was 21 years and the minimum number of years of work was 1 year, with a mean of 11 years. After classifying the respondents into four categories for years of service, as in (Figure 4), it became clear that about 86.52% of the respondents are within the categories of agricultural work years 1 - 7 and 15 - 21, which constitute more than three quarters of the respondents.

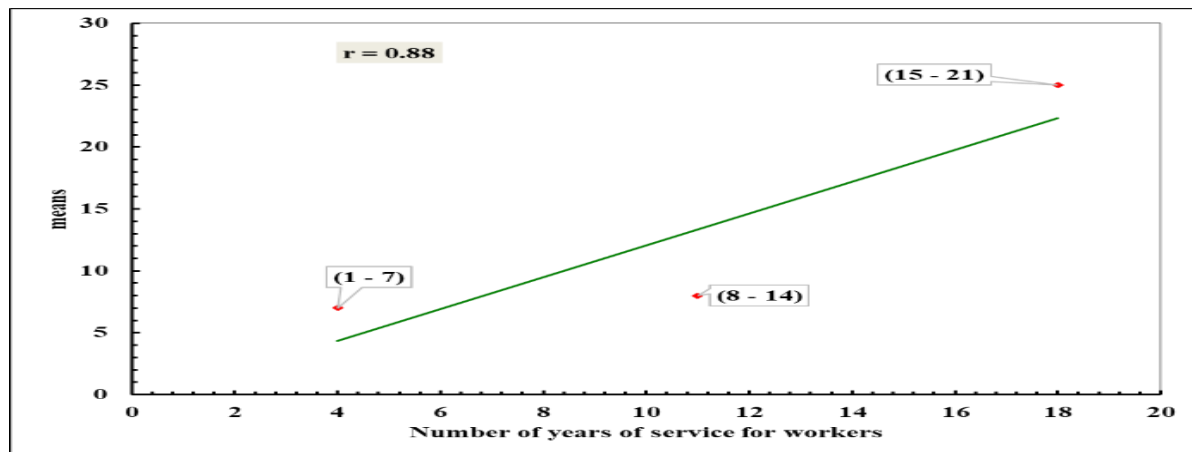


Figure 4. Number of years of service for workers in the agricultural innovation system.

from fig (4) that most of the workers in the agricultural innovation system have good years of service that carry with them field knowledge and skill that enables them to implement the goals of the components of the agricultural innovation system for the yellow corn crop in Babylon Governorate, to find the correlation between the level of respondents' approval and the number of **3-Arranging the fields of proposed solutions to improve the performance of the agricultural innovation system.**

The results showed that the proposed solutions to improve the performance of the agricultural innovation system, which numbered 4 fields, obtained weighted means ranging between 4.05-4.74 degrees, and percentage weights ranged between

years of work, a simple correlation coefficient was used, which reached a value of 0.88, which shows the presence of a strong and direct relationship, that is, the more years the respondent has worked, the greater his ability to implement activities related to the agricultural innovation system efficiently and effectively.

80.94% - 94.88% degrees, as shown in (Figure 5), and therefore all fields of proposed solutions depend on improving the performance of the agricultural innovation system because each of them obtained a weighted medium greater than the default mean of 3 degrees.

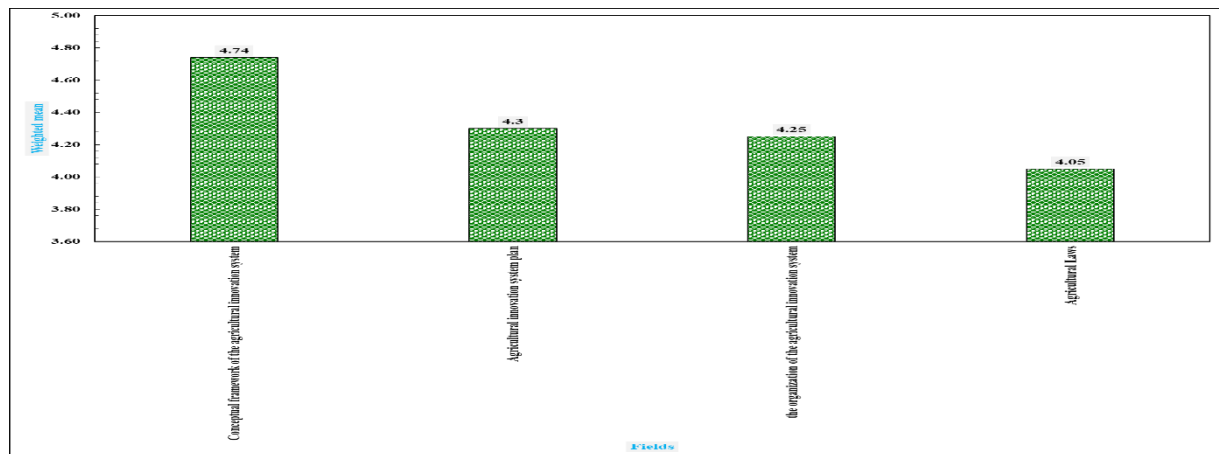


Figure 5. Distribution of respondents according to the proposed solutions to improve the performance of the agricultural innovation system.

from figure 5 that there was convergence between the weighted circles of the fields related to the proposed solutions to improve the performance of the agricultural innovation system, however, the field related to (the conceptual framework of the agricultural innovation system) came in the first place with a weighted mean 4.74 degrees, and a percentage weight 94.88% degrees, and the reason for this may be due to the fact that the agricultural innovation system is still modern in Iraq and has not been widely applied on the ground, so the concepts related to this system in terms of its concept, and its components, its importance, its goals, its principles and others are still unknown to many workers in institutions related to agricultural work, so they need more information, knowledge and experience related to this system.

As for the field related to (agricultural laws), it came in the last order with a weighted mean 4.05 degrees, and a percentage weight 80.94% degrees, and the reason for this may be due to the presence of many laws and legislations concerned with agricultural work that are either not

activated or partially applied due to the overlap of powers between the regulatory and security agencies in the Governorate so that they cannot take punitive measures to deter anyone who tries to harm the corn crop.

4-Arranging the items of each field of improving the performance of the agricultural innovation system, represented in the following fields: (conceptual framework of the agricultural innovation system, agricultural innovation system plan, and organization of the agricultural innovation system, agricultural laws).

1- Conceptual framework of the agricultural innovation system

The proposed items under the field of the conceptual framework of the agricultural innovation system consist of 8 items. These items received weighted means ranging from 4.46 to 4.96, indicating a high degree of agreement. The percentage weights assigned to these items range from

89.2% to 99.2%, as presented in (Figure6). Therefore, all the items associated with the conceptual framework of the agricultural innovation system rely on the proposed solutions aimed at improving the

performance of the agricultural innovation system. Each of these items achieved a weighted mean higher than the midpoint default of 3 degrees, signifying a significant level of approval.

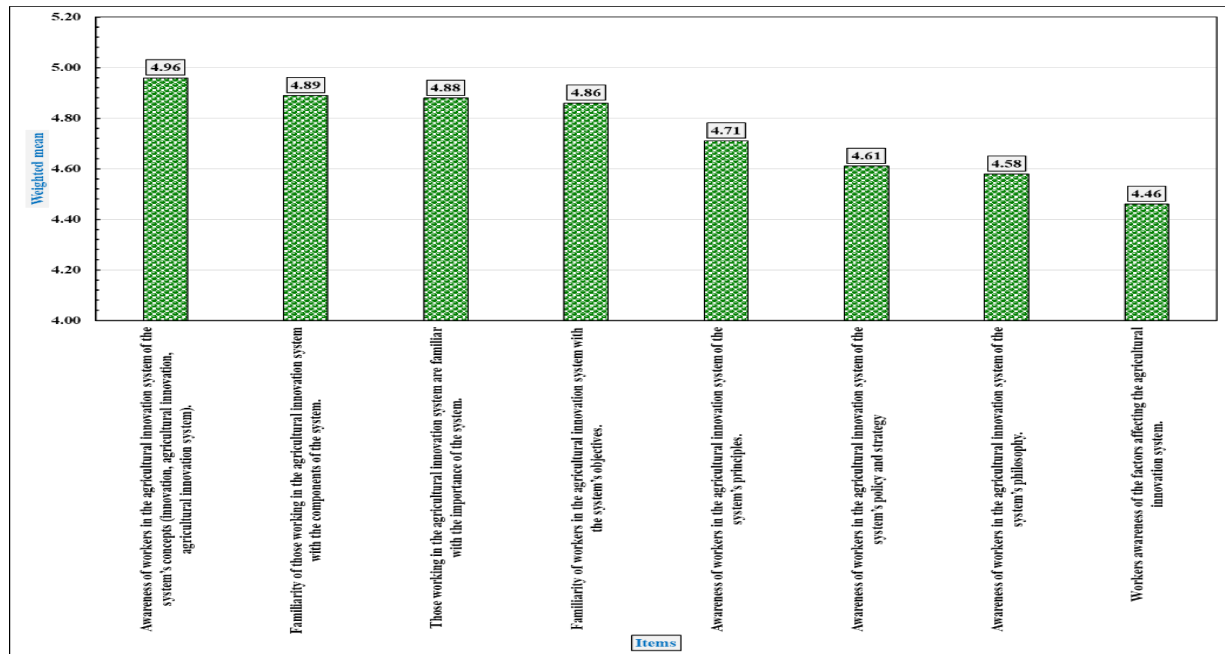


Figure 6. Distribution of respondents according to the items of the proposed solutions for the field of conceptual framework of the agricultural innovation system.

from figure 6 that there was a convergence between the weighted circles of the items related to the field of (conceptual framework of the agricultural innovation system), however, the item related to (the awareness of workers in the agricultural innovation system of the concepts of the system (innovation, agricultural innovation, agricultural innovation system) ranked first with a weighted mean 4.96 degrees, and a percentage weight 99.2%. As for the item related to (workers' awareness of the factors affecting the agricultural innovation system), it came in the last order with a weighted mean of 4.46

degrees, and the reason for this may be due to the importance that respondents attach to this paragraph as it helps workers in the agricultural innovation system to remove any confusion or ambiguity they have. Towards these concepts, as well as this will contribute to the creation of a positive work culture through their understanding and comprehension of these concepts and linking them with other concepts related to the agricultural innovation system.

degrees, and a percentage weight of 89.2 % degrees, and the reason for this may be due to the lack of interest of the respondents in the factors affecting the

agricultural innovation system, perhaps because of their lack of experience and knowledge in this field, despite its importance in determining the outputs of the system to be achieved.

2. Agricultural Innovation System Plan

The Agricultural Innovation System Plan encompasses 9 proposed items. These items obtained weighted means ranging from 3.74 to 4.63, reflecting a moderate to

high level of agreement. The percentage weights assigned to these items range from 74.8% to 92.6% as presented in (Figure 7), consequently, all items pertaining to the Agricultural Innovation System Plan rely on the proposed solutions aimed at enhancing the performance of the agricultural innovation system. Each of these items achieved a weighted mean degree surpassing the default mean of 3, indicating a significant level of consensus.

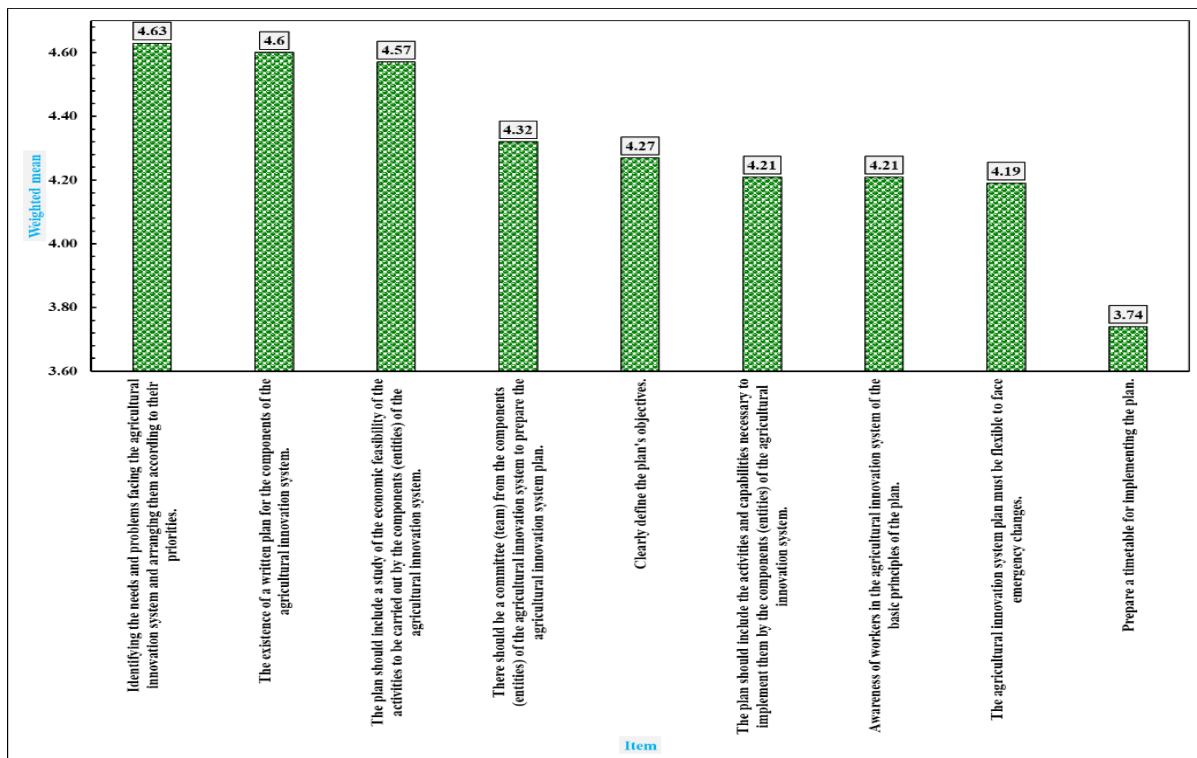


Figure 7. Distribution of respondents according to the items of the proposed solutions for the field of agricultural innovation system plan.

from figure 7, it can be observed that there was convergence among the weighted degree of the items related to the field of the agricultural innovation system plan. In particular, the item related to "identifying the needs and problems facing the agricultural innovation system and arranging them according to their priorities" ranked first with a weighted mean of 4.63 degrees and a percentage

weight of 92.6%. This might attributed to the respondents' belief that it was the crucial initial step in ensuring the success of the agricultural innovation system's components in achieving their desired objectives. Prioritizing and addressing the needs and problems in a systematic manner yields several important outcomes, including timely problem-solving and providing credibility and seriousness to the

system's components as they endeavor to address these challenges within the available resources (human, material, and financial).

On the other hand, the item related to "the numbers of a timetable for the implementation of the plan" ranked last with a weighted mean of 3.74 degrees and a percentage weight of 74.8%. This could be because determining the timing and scheduling of the plan's implementation was a well-known aspect to the respondents and is considered a standard practice in plan preparation. Hence, this item was ranked last in importance.

3 - The organization of the agricultural innovation system,

The proposed items related to this field 10 items with weighted means ranging from 3.95 to 4.66 degrees and percentage weights ranging from 79% to 93.2% as presented in (Figure 8), consequently, all items associated with the organization of the agricultural innovation system rely on the proposed solutions aimed at improving its performance. Each of these items achieved a weighted mean higher than the default mean of 3 degrees, indicating a significant level of approval.

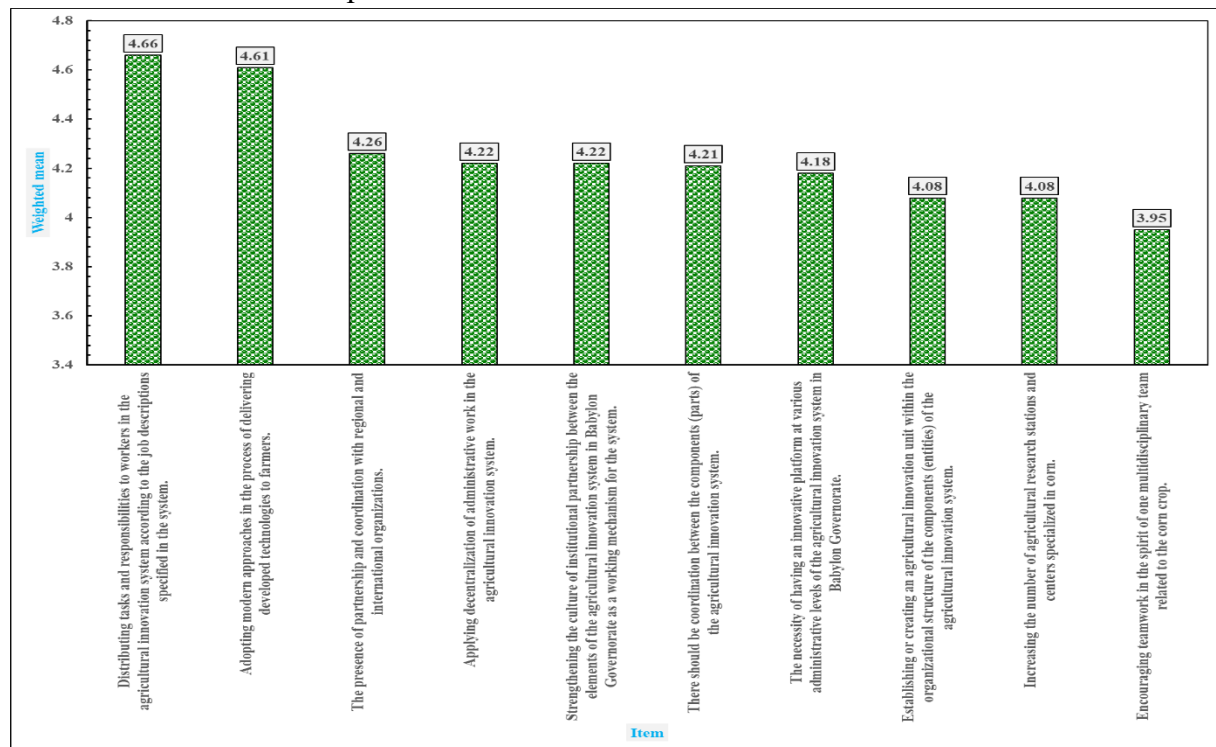


Figure 8. Distribution of respondents according to the proposed solutions for the field of organizing the agricultural innovation system.

from figure 8, we observed a convergence in the weighted degree of the items pertaining to the organization of the agricultural innovation system. Specifically, the item that focused on the "distribution of tasks and responsibilities

among workers in the agricultural innovation system according to the job description specified in the system" ranked first with a weighted mean degree of 4.66 and a weight of 93.2%. This high ranking can be attributed to the benefits of

distributing tasks and responsibilities based on job descriptions, such as enhancing clarity regarding duties, preventing role duplication and conflicts, facilitating appropriate training, improving job satisfaction, enabling accountability for task failures, and supporting performance evaluation by the relevant administration.

In contrast, the item related to "encouraging collective work in the spirit of one multidisciplinary team regarding the corn crop" ranked last with a weighted mean degree of 3.95 and a weight of 79%. This lower ranking might be due to the belief of some respondents that the nature of services provided by the components of the agricultural innovation system is

governed by specific laws or regulations, which limits the extent to which collective action can be encouraged.

4 - Agricultural Laws

The proposed items in this field 21 items, obtained weighted means ranging from 3.7 to 4.5 degrees, with relative weights ranging from 74% to 90% as presented in (Figure 9), All of these items garnered approval and were considered as part of the proposed solutions to enhance the performance of the agricultural innovation system. Each item achieved a weighted mean higher than the default mean of 3 degrees, indicating consensus and support for these items related to agricultural laws.

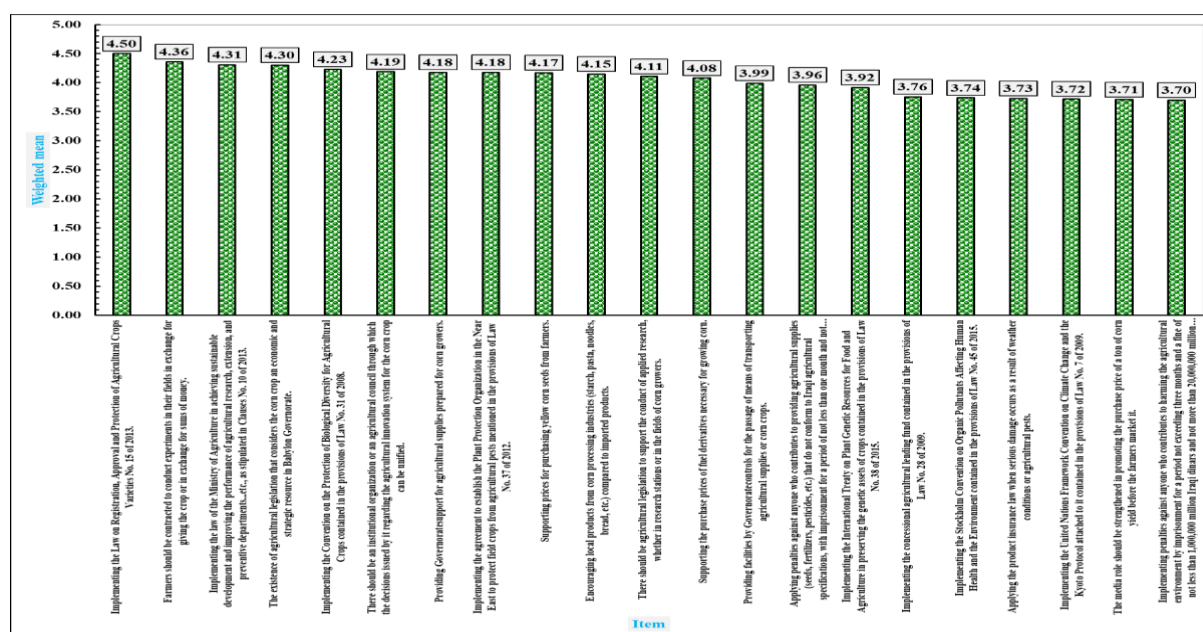


Figure 9. Distribution of respondents according to the items of the proposed solutions for the field of Agricultural Laws.

from figure 9 that there was a convergence between the weighted circles of the items related to the field of (Agricultural Laws), however, the item related to (the need to apply the Law of Registration, Approval and Protection of Varieties for Agricultural

Crops No. 15 of 2013) ranked first with a weighted mean of 4.5 degrees, and a percentage weight 90% degrees and the reason for this might been attributed to ensuring the preservation of the cultivated varieties and protecting them from

deterioration or mixing them with unknown varieties, which loses their basic characteristics in terms of productivity and resistance Agricultural pests.

As for the item related to (the need to apply penalties against anyone who contributes to damage to the agricultural environment by imprisonment for a period not exceeding three months and a fine of not less than 1,000,000 million Iraqi dinars and not more than 20,000,000 million Iraqi dinars contained in the provisions of Law No. 27 of 2009), it came in the last order with a weighted mean of 3.7 degrees and a percentage weight 74% degrees, and the reason for this might be due to the fact that the application of penalties is the competence of environmental regulatory authorities. Babylon Environment Directorate) and security (Babylon Governorate Police), which are not within the powers of the components of the agricultural innovation system, in addition to the fact that their application is subject to influences, favoritism, and favoritism by several parties in the Governorate, which makes it difficult to apply these penalties on the ground.

In the light of the aforementioned values of the Weighted means of the respondents' opinions on the proposed solutions to improve the performance of the agricultural innovation system, we accept the research hypothesis that states that there is agreement or high approval of the opinions of the respondents (managers and researchers) on the proposed solutions to improve the performance of the agricultural innovation system in responding effectively to the challenges of corn farmers in Babylon Governorate.

Conclusion

In the light of the results of the research, the following is concluded:

- 1- The agreement of all respondents on items and fields to improve the performance of the agricultural innovation system confirms their appropriateness and applicability in light of the capabilities available to the components (entities) of the agricultural innovation system in the Governorate.
- 2- The fact that the field of conceptual framework of the agricultural innovation system ranked first compared to the rest of the fields of the agricultural innovation system confirms the need of respondents (managers and researchers) for more information and clarification about it, which contributes to the formation of a clear and realistic picture of everything related to the agricultural innovation system.

Recommendations

In light of the results and conclusions the researcher recommends the following:

- 1- In order to improve the performance of the agricultural innovation system, it is necessary that the components (entities) of the agricultural innovation system adopt the results of the research.
- 2- The components (entities) of the agricultural innovation system when applying the results of the research should attention to all fields studied within improving the performance of the agricultural innovation system with a greater focus on the field of conceptual framework of the agricultural innovation system.

Conflict of interest

The author has no conflict of interest.

References

1- **Ridha, B.A. and N.A. Najwa. 2020.** Impact of Activities Offered by Agricultural Extension and Training Office for Rural Women in Iraq. *Indian Journal of Ecology* 47 (2): 381-384.

[DOI: 10.13140/RG.2.2.14744.21760](https://doi.org/10.13140/RG.2.2.14744.21760)

2-**AL-Aridhee, A. and N. Mahdi. 2022** .Influence of Irrigation Systems and Cover Crop on Water Productivity and Corn Growth. *Iraqi Journal of Agricultural Sciences* .53(6):1465-1475.

<https://doi.org/10.36103/ijas.v53i6.1663>

3- **Mutar, Husam. H; I. S. Alsaadawi, and N. R. Lahmod .2022.** Trifluralin and Corn Residues for Weed Management in Mung Bean Fields - Central Iraq. *Iraqi Journal of Science*. 63 (3):938- 947.

<https://doi.org/10.24996/ijas.2022.63.3.3>

4-**Abdulla, S. M .sheikh; D.A. Abdul Khaliq and Sh .I. Towfiq. 2022.** Partial Diallel Analysis of Corn Inbred Lines for Kernel Yield and Its Components in Iraq. *Iraqi Journal of Agricultural Sciences*. 53(5):1190-1202.

<https://doi.org/10.36103/ijas.v53i5.1633>

5- **Central Organization for Statistics Directorate of Agricultural Statistics Crop Production 2019 2022. Baghdad .Iraq**

6- **Al-Taye, H.K; S .O. Fayyadh and H.R.Hassooni. 2021.** A Vision to Develop the Effectiveness of the Dissemination of

Innovations to Rationalize the Use of Irrigation Water in Iraqi Agriculture 2nd Virtual International Scientific Agricultural Conference IOP Conf Series: Earth and Environmental Science 735(012036) 1-7

<https://doi.org/10.1088/1755-1315/735/1/012036>

7- **Saadia, M. 2021.** The Role of Quality Management System in Promoting Innovation in Companies. *Iraqi Journal of Science . Special Issue:* 96-103

<https://doi.org/10.24996/ijas.2021.SI.1.13>

8- **Mohammed, K. A. 2018.** The Scale and Importance of Corn Marketing Problems and Constraints First International Conference on Agricultural Research. From 10 to 11 April Faculty of Agriculture University of Tikrit 1-1344

9- **Latif, M. A and A .D. Kassar. 2020.** Determination of the Investment Priorities of the Agricultural Scientific Research in Iraq by Using the Policy Analysis Matrix for Some of the Main Grains Crops. *Journal of Agriculture Research*. 25(1): 109-133.

<https://www.iasj.net/iasj/article/219794>

10 - **Al-Bayati , Z. H and M. H . AL-jumaily .2021.** The knowledge Level of (*Zea mays*) growers and its relationship to some variables in Hawija district / Kirkuk Governorate. *Journal of Agricultural Sciences*. 12 (1) :20-29

<https://www.iasj.net/iasj/article/203047>

11- **Khdiar, M. Y; A. A. Mahmood; L.A. Shihab and G. E. Hardy. 2023.** Isolation of Fungi from Petroleum-Contaminated Soil and Evaluation of Their Ability to



Degrade Crude Oil, Iraqi Journal of Applied Physics .19(1):13-20

<https://www.iasj.net/iasj/article/260804>

12- **Uzakov, Z.Z; K.N. Karimov ; Z.U. Uzakov and R.A. Eshonkulov .2023.** Accumulation of Heavy Metals in Agricultural Crops and Ecological Series of Crops Placement. Baghdad Science Journal. 20 (1) :58-73.

<https://doi.org/10.21123/bsj.2022.7210>

13- **Al-Jubouri M.A.2016.** Evaluation of Governorate Processing Activity in the Process of Dissemination of Seed Varieties and Chemical Fertilizers Technologies in Corn Cultivation in Babylon Governorate. Al-Furat Journal of Agricultural Sciences. 8(2): 260-269.

<https://www.iasj.net/iasj/article/112777>

14- **Alnagar, S.AS and Z.R. Kadhim. 2021.** The Economic Effects of Lost Production and Marketing of Corn in Iraq Babylon Governorate as a Model. Al-Muthanna Journal of Agricultural Sciences. 8 (3): 79-93.

<https://www.iasj.net/iasj/article/216553>

15-**Al-Janabi, K. L. 2021.** An economic analysis of the effects of the Governorate intervention policy for the corn crop in Iraq Babylon Governorate as a model unpublished master's thesis. Department of Agricultural Economics. College of Agricultural Engineering Sciences. University of Baghdad 1- 178

16-**Khudher, TH. H and M.A. Mashhdany. 2016 .**Application of Corn Growers to Some Management Practices That Maintain Soil Sustainability and Fertility in the Musayyib/Babylon Project

District. Iraqi Agriculture Research Journal. 21(1) :211-223.

<https://ijarmoa.gov.iq/wp-content/>

17- **Al-Tamimi. A.A and A.A.Al-Badri. 2023 .**Analysis of Agricultural Practices Used by Cereal Farmers to Adopt to Phenomenon of Climate Variation in the Governorates of the Central Region of Iraq Iraqi. Journal of Agricultural Sciences. 54(1): 303 -316.

<https://www.iasj.net/iasj/download/0e088fcae892862a>

18- **Ridha, B. A; I.R. Hassuni and A.T. Al-Salhi.2020.** Evaluation of Training Courses for Agricultural Employees Conducted by the Training and Rehabilitation Department Belonging to the Extension and Training of Agricultural in Iraq. Plant Archives. 20(1):155- 162

[https://www.plantarchives.org/20-1/155-162%20\(5404\).pdf](https://www.plantarchives.org/20-1/155-162%20(5404).pdf)

19- **Qandilji, A. I. 2019.** Scientific Research Methodology. Dar AL-Yazori for Publishing and Distribution. Amman. Jordan.

