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LEVEL APPLICATION OF FARMERS TO SCIENTIFIC RECOMMENDATIONS FOR THE YELLOW CORN CROP IN AL-HAMDANIYA DISTRICT / NINEVEH GOVERNORATE

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ABSTRACT

This research was carried out in Al-Hamdaniya district of Nineveh governorate, and this study aimed to identify the level of farmers' application of scientific recommendations for the yellow corn crop in Al-Hamdaniya district / Nineveh governorate. Identify the level of yellow maize farmers' application of scientific recommendations in the field of cultivation and service of the crop. As well as identifying the correlation between the level of farmers' application of the scientific recommendations for the yellow corn crop and each of the following independent factors (level of education, age, number of years of work in agriculture, cultivated land area, agricultural information sources) . The research community included all the farmers of the yellow corn crop in the Al-Hamdaniya district, who numbered (188) farmers, a random sample of them was taken at a rate of (50%), and thus the total number of the respondents was (94). A questionnaire was prepared for the purpose of data collection. It consisted of two parts, the first included independent variables data related to the respondents, while the second part included a scale to measure the level of application of scientific recommendations by yellow Corn Crop farmers. The results showed that more than half of the respondents were applying the scientific recommendations for the yellow corn crop at an average level. The results also showed that the variables (level of education, age and number of years of work in agriculture) had a significant correlation with the level of application of the scientific recommendations by yellow Corn Crop farmers. While the sources of agricultural information and the area of cultivated land did not have any significant impact at the level of application, the research included conclusions, the most important of which was that the level of application of yellow corn farmers is average in relation to scientific recommendations, as well as the absence of a guiding role in the research area, which had the greatest impact on the application of farmers to scientific recommendations. The researcher also recommended the establishment of various training courses on aspects of soil management such as water and agricultural pest control for the yellow corn crop for workers in agricultural extension agencies. As for the statistical methods used in the research, (range and arithmetic mean, Pearson equation and Spearman-Brown equation).

INTRODUCTION

The yellow corn crop is a summer crop belonging to the Gramineae family and the genus Zea (Orhun, 2013) it is believed that its original home is Mexico and Peru, from which it moved to the rest of the countries (Lampietti, 2011). The yellow

corn crop is one of the important industrial food grain crops in many regions of the world. and this crop ranks third in the world after wheat and rice in terms of area and production (Shawkat, *et al.*, 2023). The cultivated area in 2010 amounted to approximately 644 million hectares, producing an average of 3500 tons/ hectares (Food and Agriculture Organization of the United Nations, 2010). The United States of America is at the forefront in the cultivation and production of maize, accounting for 18% of the global area and with a seed productivity of 31%. Followed by China, Brazil and India, either in the Arab world, the cultivated area reached 222 million hectares, which produced 2.4 tons / hectare (Al-Hayali, and Al-Wasiti, 2015). Egypt is at the forefront of the Arab countries in the cultivation and production of yellow corn (Ahmed,2020), followed by Somalia and the Morocco. In Iraq, it is considered one of the important grain crops as well, as it ranks third in terms of importance after the wheat and rice crops (Obaid, 2019), as the cultivated area reached (2.1809) hectares (Zahra, *et al.*, 2018) and the production amount was 122,600 thousand tons of seeds (Statistical Manual, 2012). Because of the great economic importance of human and animal nutrition and various other uses such as treatment, production of dyes, and its use as a biofuel instead of traditional motor fuel or other uses, it has been called the king of crops (El Razek, Jibril 2019). Despite the importance of the crop, it still suffers from a shortage of cultivated areas and total production in Iraq compared to global production. According to data in 2014, the area planted with the crop in Iraq reached more than 378,061 thousand dunums, with a total production of 289,288 tons, with an average production of 765 kg / dunum (Central Agency, 2014). One of the reasons for this big difference in production is perhaps the lack of use of high-productivity varieties that are suitable for the environmental conditions in Iraq and the failure to secure the soil and crop service as required, as is the case in many countries of the world (Kareem,2023). and this production is still much less than the actual need (Yasmen,2019), as it fills only a small part of the local consumption, and expectations indicate that the need for yellow corn grain continues to increase due to the increase in the number of populations in the world (Mamdouh, & Gerges,2014) and the significant expansion of livestock development projects (Daoud. *et al.*, 2006). Since The farmer is primarily responsible for scientific recommendations related to the process of cultivation and service of the yellow corn crop in order to improve productivity and quality ,the state must take care of this segment of society(Sadeq,2023), and agricultural extension has its distinctive fingerprints in raising the productivity of one acre of yellow corn crop and expanding its cultivation from Through extension education programs that contribute to improving the knowledge(Salih,2016),(Sabri, Abed,2020), skills and attitudes of farmers to exploit resources, and the possibilities available to them make the best use of (Oladele, 2001) (Fayyad, 2013). Whereas, standing on the level of farmers' application of scientific recommendations (Shaker, 2009). related to the cultivation and service of the yellow corn crop is the basis for building effective extension programs stemming from reality (Talal and Dhoha,2020). Therefore, agricultural extension must be identifying these problems and challenges which was facing farmers and transfer them to institutions and research centers to study them and to determine appropriate methods to solve them (Al-Tarushi, *et.al*, 2015), (Elzarka, Fayed,2020). Research aims to determine implementation level maize farmers in Al-Hamdaniya district of Nineveh

Governorate to the scientific recommendations related to some cultivation and service operations of the crop (Kadhum,2023), and to determine implementation level maize farmers to the scientific recommendations for each process of cultivation and service of the crop, and to identify the relationship between implementation level maize farmers with independent variables.

The research aims are:

1- Identifying the level of farmers' application of the scientific recommendations for the yellow corn crop in Al-Hamdaniya District / Nineveh Governorate.
2- Identify the level of yellow maize farmers' application of scientific recommendations in the field of cultivation and service of the crop.
3- Identifying the correlation between the level of farmers' application of the scientific recommendations for the yellow corn crop and each of the following independent factors (Academic achievement, age, number of years of work in agriculture, cultivated land area, agricultural information sources).

MATERIALS AND METHODS

Research hypotheses

- There is no correlation between the level of application of farmers to scientific recommendations according to Academic achievement.
- There is no correlation between the level of application of farmers to scientific recommendations according to age.
- There is no correlation between the level of application of farmers to scientific recommendations according to Cultivated land area.
- There is no correlation between the level of application of farmers to scientific recommendations according to Number of years of work in agriculture.
- There is no correlation between the level of application of farmers to scientific recommendations according to Agricultural information sources.

Research area

Al-Hamdaniya district was chosen as an area to conduct the research, due to the cultivation of the yellow corn crop in this area and considering it an important crop, in addition to the farmers benefiting from the economic return from the cultivation of this crop, which brings them abundant money.

The research community and the sample

The research community included all the farmers of the yellow corn crop in the Al-Hamdaniya district, which numbered (188) farmers, a random sample of them was taken at a rate of (50%), and thus the total number of the respondents was (94).

Preparing the questionnaire form

A questionnaire was prepared for the purpose of data collection, consisting of two parts. The first part included independent data related to the respondents, while the second part included a scale to measure implementation level scientific recommendations by maize farmers. After reviewing the scientific literature, research and extension bulletins related to the wheat crop and In order to verify validity and for the purpose of ensuring the validity of the items developed in their initial form, they were presented to (13) specialists and experts in the field of agricultural

extension and the Field Crops Department at the College of Agriculture and Forestry/University of Mosul, to identify the suitability of the scale for the purpose for which it was developed, such as the type of statements and the style. Its writing, its clarity, its accuracy, and how to answer its paragraphs. Some paragraphs were modified and deleted from the total number of paragraphs prepared, and the percentages of approval were calculated. The paragraphs that received less than (80%) of the experts' approval were excluded, and thus the questionnaire was ready to collect primary data, a scale was built to measure implementation level wheat farmers, consisting of 22 recommendations distributed on four axes, as follows: (Prepare: Land for cultivation), (crop cultivation), (crop irrigation) and (pest control), with (6), (5), (6) and (5) recommendations, respectively. After that, the questionnaire was presented to experts in the Department of Agricultural Extension at the College of Agriculture and Forestry and in the Department of Field Crops at the University of Mosul for the purpose of achieving the face validity and content validity of the tool. Based on the experts' amendments, some items were modified. The pretest was conducted in July of 2022 on a sample of (30) respondents Except of the research sample, and the reliability was extracted by the split-half method using Pearson's equation, then the result was corrected by Spearman's equation, and the reliability coefficient reached (0.91) (Al-Baldawi, 2009) (Singh, 2021).

Measuring the independent variables and the dependent factor

The qualitative independent variables were classified with the following weights:

- Age It was calculated by the number of years of respondents when collecting data (Abdullah, *et al.*, 2021).
- Academic achievement: (Illiterate = zero, read and write = 1, elementary = 2, primary = 3, middle school = 4, institute = 5, college = 6).
- Cultivated land area: It was measured by the number of dunams planted with corn owned by the farmer.
- Number of years of work in agriculture: It was measured by the number of years of work in agriculture.
- Agricultural information sources: They were measured by giving them the following symbols: (mostly = 2, sometimes = 1, do not use = 0). As for the dependent variable, it was measured through the total scores obtained by the respondent, which determine the level of his application of scientific recommendations related to some operations of cultivation and service of the wheat crop, using the standard degree. -1 to +1), and high (more than +1). Thus, the final degree of the process ranged between (0-44) degrees, a degree was determined for each of the recommendations, two degrees for the correct application, one degree for the correct application to a certain extent, and zero for the wrong application. Thus, the scale's highest degree reached (44) degrees and its lowest degree was (0).

RESULTS AND DISCUSSION

To know implementation level informed recommendations for yellow maize farmers in Al-Hamdaniya District / Nineveh Governorate.

The search results are clear degrees of farmers' application level of scientific recommendations for the yellow corn crop were between (9-38) degrees, and with a mean of (23.33). The percentage of respondents whose Level of application of scientific recommendations was low was (23.40%), while the percentage of respondents who applied scientific recommendations was in the higher category (22.35%).

Table (1): shows the level of the respondents' application of the scientific recommendations for the yellow corn crop

Application level	Standard score	the number	%
Low	less than -1	22	23.40
Medium	between -1 and +1	51	54.25
High	more than +1	21	22.35
Total		94	100%

It is clear from Table (1) that more than half of the respondents fall into the middle category, with a percentage of (54.25%), while the low category follows with a percentage of (23.40%), while the high category has a percentage of (22.35).

This shows from Table (1) that more than half of the respondents were applying the scientific recommendations for the yellow corn crop at an average level this agree with (Al-Ajili and Majed, 2007), (Kadem, 2022) and not agree (Thamer and Ashwaq, 2015). It is an acceptable result to some extent. But in fact, this result is considered unacceptable when compared to other studies, given that the crop has been cultivated for a long time in Iraq, which means that the farmer has perfected his cultivation. It may also be due to the fact that many farmers are accustomed to practicing traditional agricultural habits such as plowing, cultivation, irrigation, fertilization and pest control for this crop, which prevented them from applying modern scientific recommendations (Arab Organization for Agricultural Development, 2000), (Al-Taie,2008).

Second goal

The research results showed that the degrees of farmers' application of the scientific recommendations in the field of preparing the land for agriculture ranged between (0-10) degrees on a scale whose degree ranged (0-12) degrees, as shown in Table (2). More than half of the respondents had an average level of application in this field, reaching (53.20%).

The field of crop cultivation

The research results showed that the degrees of farmers' application of scientific recommendations in the field of crop cultivation ranged between (2-10) degrees on a scale whose degree ranged (0-10) degrees, as shown in Table (2) that more than Two thirds of the respondents had an average level of application in this field, with a percentage of (70.21%).

The field of Crop irrigation

When distributing the respondents according to the level of their application of scientific recommendations in this field, it turns out that (61.70%) of them It was

in the medium category for application level, and this is what was observed from Table (2). Where the results that were reached show that the Implementation level degrees of scientific recommendations ranged between (2-12) degrees, according to a scale whose degree ranged from (0-12) degrees.

Table (2): Distribution of respondents according to their Implementation level in the fields of crop cultivation and service

The Fields	Application-level categories	Numbers	%
Preparing The Land for Agriculture	Low (less than -1)	20	21.27
	Medium (between -1 and +1)	50	53.20
	High (more than +1)	24	25.53
Crop Cultivation	Low (less than -1)	18	19.14
	Medium (between -1 and +1)	66	70.21
	High (more than +1)	10	10.65
Crop Irrigation	Low (less than -1)	23	24.48
	Medium (between -1 and +1)	58	61.70
	High (more than +1)	13	13.82
Agricultural Pest Control	Low (less than -1)	8	8.51
	Medium (between -1 and +1)	70	74.46
	High (more than +1)	16	17.03

The field of agricultural pest control

When distributing the respondents according to the level of their application of scientific recommendations in this field, it turns out that (74.46%) of them of them were within the average level of application, that is, nearly three quarters of the respondents, which is almost a high percentage compared to the rest of the fields. This is what was observed from Table (2). The results obtained show to implementation level scientific recommendations ranged between (4-8) degrees, according to a scale whose degree ranged from (0-10) degrees.

The third objective: to identify the correlation between the level of farmers' application of the scientific recommendations for the yellow corn crop and each of the following independent factors (Academic achievement, age, number of years of work in agriculture, cultivated land area, agricultural information sources).

Academic achievement

From Table (3), when the respondents are divided into categories according to this variable, it is clear that the percentage of respondents who have a low level of education (illiterates), (read and write) and (primary graduates) were (4.25%) and (8.51%)) and (14.89%) respectively, while the percentage of those who had an average education represented by the categories of (intermediate) and (preparatory) stage graduates reached 31.91 and (21.30), respectively, while the percentage of respondents who had a high level of education represented Graduates of (Institute) and (College) (4.25%) and (14.89), respectively. In order to find the correlation between implementation level the scientific recommendations by maize farmers, the Spearman-Brown correlation coefficient was used, whose value was (0.245), which is a significant value this agree with (Talal and Dhoha,2021) and (Mohamed and Abdel Tawab,2020), (Hade at. el,2021) and disagree with (Kadhum, and Ali ,2023).

The reason for this may be due to the high percentage of educated people among the respondents and the small percentage of people with low education, which in turn is reflected in the breadth of the respondents' awareness, knowledge, and information about agricultural topics in general and the corn crop in particular, which caused a significant relationship between the level of application of agricultural recommendations and the level of education of the respondents.

Table (3): Correlational relationship between the level of farmers' application of the scientific recommendations for the yellow corn crop and each of the independent factors

Variables	No.	%	Pearson	Spearman	Tabular value
Academic achievement:					
Illiterate	4	4.25	0.245*		0.036
Primary	8	8.51			
Secondary	14	14.89			
A middle school graduated.	30	31.91			
Prep graduate.	20	21.30			
Institute graduate.	4	4.25			
College	14	14.89			
Age:					
(22-30) years old	53	56.38	*0,210		0.041
(31-39) years old	26	27.65			
(40-48) years old	15	15.97			
Number of years working of agriculture:					
(7-16) years	20	21.27	**0,342		0.001
(17-26) years	40	42.55			
(27-36) years	34	36.18			
Cultivation land area:					
(20-40) acres	51	54.27	0,098		NS
(41-61) acres	20	21.27			
(62-82) acres	23	24.46			
Agricultural information sources:					
(12 -18) low	23	24.46	0,069		NS
(19-25) medium	51	54,27			
(More than 26) high	20	21.27			

Age

It appeared that the lowest age of the respondents was 22 years and the highest age was 48 years. When distributing the respondents according to age groups, it was found that the age group (22-30) years increased, reaching (56.38%), while the age group (31-39) years was the percentage reached (27.65%), while the age group (40-48) years reached (15.97%), and from this result we can generalize that all respondents are young people. To determine the relationship between level application and the scientific recommendations by maize farmers, the Pearson correlation coefficient was used, whose value was (0,210), which is a significant value. This agrees with (Saeed, 2019), (Mohamed and Abdel Tawab,2020) and (Naji, and Ali, 2023). Perhaps the reason for this is that most of the respondents are young

and young, and this leads to an increase in the level of application of new technologies and modern recommendations due to their activity, energy and vitality, in addition to the rush and enthusiasm that the young group possesses, which in turn is reflected in an increase in the level of application.

Number of years of work in agriculture

The results showed that the lowest number of years of work in agriculture was 7 years, and the highest number of years of work in agriculture was 36 years. This variable was divided into 3 categories, namely, the low (7-16) years, and the rate of (21.27%) The percentage of the category (17-26) years was (42.55%), while the percentage of the category (27-36) years was (36.18). In order to find the correlation between implementation level maize farmers to scientific recommendations and the number of years of work in agriculture, Pearson's simple correlation coefficient was used, whose value amounted to (0.342), which is a significant value. This agrees with (Ismail,2021), (Talal and Mohammed, 2022). The reason for this may be because the increase in the number of years of agricultural work led to an increase in their experience, which was reflected in the level of their application of modern recommendations related to the yellow corn crop.

Cultivated land area

From Table (3), it becomes clear to us that the area of land planted with maize crop was divided into three categories, namely, the category (20-40) dunams, and its percentage was (54,27%), while the percentage of the category (41- 61) dunams (21.27%), while the percentage of the last category was (62 or more) dunams (24.46%), and determining the correlation between the level of yellow maize farmers' application of scientific recommendations and the cultivated land area, Pearson's simple correlation coefficient was used, which reached (0.098), which is the value of Not significant, and this result may be due to the fact that most farmers own small agricultural lands and that there is no need to apply modern agricultural recommendations because of the relatively small area planted with this crop.

Agricultural information sources

The results showed that the highest numerical value of agricultural information sources is 29 and the lowest value is 12, and when distributing the respondents according to the categories of agricultural information sources, the high percentage of respondents who fall within the medium communication category reached (54,27%), while the percentage of farmers in the low-contact category was 24.46%, while the high-contact category was (21.27%). determine the correlation between the level of maize farmers' application of scientific and agricultural recommendations information sources, The person correlation coefficient was used, which amounted to (0,069), which is not significant Thus, the research hypothesis is accepted and the null hypothesis, which states that there is no significant correlation, is rejected. This result may be due to the fact that the sources of information that farmers were exposed to did not affect their application of modern agricultural recommendations, (Talal and Mohammed, 2022). or they were not in the field of applying modern agricultural recommendations for maize crop.

CONCLUSIONS

It can be concluded that although implementation level maize growers is described as medium, and that The average scores of the respondents were close to the middle of the scale, but this result is not acceptable because there is no change in it, as it is similar to the results of previous studies on the same topic more than a decade ago. It is also noted that the effective and convincing educational extension role for farmers to follow the best methods is noted. and modern methods of cultivation and production of the crop, and then raising implementation level corn growers and changing it for the better, this is evident from the stability of the farmers' application level and the fact that more than two-thirds of them fall in the middle a level that is trending down without changing for the better. The following independent variables (age, educational attainment, number of years of work in agriculture) are among the factors that have a significant contribution to influencing the level of application of scientific recommendations to farmers, as any increase in the value of these factors increases the applied level of maize farmers.

RECOMMENDATIONS

In light of the findings of the research, it can be recommended to adopt the results of this study as follows: The need for the agricultural extension apparatus to meet the needs of the target audience, such as addressing their problems and developing appropriate solutions to them. Therefore, providing various extension services to farmers, such as providing them with knowledge, experiences and recent developments related to the operations of cultivating the yellow corn crop through recommendations such as holding training courses and field visits to farmers' fields and holding and holding seminars, It is considered one of the basic matters in this field, for the purpose of upgrading the level of knowledge and experience of maize farmers in the fields of cultivation and service of the maize crop in general. Working on the establishment of various training courses on aspects of soil management such as water and pest control of the maize crop for workers in agricultural extension agencies because this contributes to increasing their knowledge and experience to be able to communicate that information to the target audience and train them on it and follow up the application of that information.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest regarding the publishing of this article.

مستوى تطبيق الزراع للتوصيات العلمية لمحصول الذرة الصفراء في قضاء الحمدانية / محافظة نينوى

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الخلاصة

نفذ هذا البحث في قضاء الحمدانية بمحافظة نينوى، وهدفت هذه الدراسة التعرف على مستوى تطبيق المزارعين للتوصيات العلمية لمحصول الذرة الصفراء في قضاء الحمدانية / محافظة نينوى. وكذلك التعرف على العلاقة الارتباطية بين مستوى تطبيق المزارعين للتوصيات العلمية لمحصول الذرة الصفراء وكل من العوامل المستقلة التالية (المستوى التعليمي، العمر، عدد سنوات العمل في الزراعة، مساحة الأراضي المزروعة، مصادر المعلومات الزراعية). شمل مجتمع البحث جميع مزارعي محصول الذرة الصفراء في قضاء الحمدانية والبالغ عددهم (188) مزارعاً، تم أخذ عينة عشوائية منهم وبنسبة (50%)، وبذلك يكون مجموع أفراد العينة كان (94). وتم إعداد استبيان لغرض جمع البيانات. وتتكون من جزأين، تضمن الأول بيانات المتغيرات المستقلة المتعلقة بالمستجيبين، بينما تضمن الجزء الثاني مقياسًا لقياس مستوى تطبيق التوصيات العلمية من قبل مزارعي الذرة. وأظهرت النتائج أن أكثر من نصف أفراد العينة يطبقون التوصيات العلمية لمحصول الذرة الصفراء بمستوى متوسط. كما أظهرت النتائج أن المتغيرات (المستوى التعليمي، العمر، عدد سنوات العمل في الزراعة) لها علاقة معنوية بمستوى تطبيق التوصيات العلمية من قبل مزارعي الذرة الصفراء، في حين لم يكن لمصادر المعلومات الزراعية ومساحة الارض المزروعة أي تأثير معنوي على مستوى التطبيق. وقد تضمن البحث استنتاجات كانت اهمها بان مستوى تطبيق زراع الذرة الصفراء متوسط بالنسبة للتوصيات العلمية كذلك غياب الدور الارشادي في منطقة البحث الذي كان له الاثر الكبير على تطبيق الزراع للتوصيات العلمية. كما اوصى الباحث إقامة دورات تدريبية مختلفة خاصة بجوانب إدارة التربة كالمياه ومكافحة الآفات الزراعية الخاصة بمحصول الذرة الصفراء للعاملين في أجهزة الإرشاد الزراعي. أما الأساليب الإحصائية المستخدمة في البحث فقد استخدمت (المدى والوسط الحسابي، معادلة بيرسون، ومعادلة سبيرمان–براون).

الكلمات المفتاحية: التطبيق، التنفيذ، محصول الذرة، الإرشاد الزراعي.

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