

Adoption level of technologies knowledge and information by Potato growers in Nineveh Governorate/ Iraq

Ahmed Awad Talb Altalb, Suzan Tahseen Muhammad and Barbara Sawicka

¹College of Agriculture and Forestry/ University of Mosul/ Republic of Iraq

² College of Agriculture Alhawije/ University Kirkuk/ Republic of Iraq

³ Faculty of Agro bio-engineering/ University of Life Science in Lublin-Poland

Corresponding author Email: ahmed_altalb@uomosul.edu.iq

DOI: <https://doi.org/10.36077/kjas/2024/v16i4.12132>

Received date: 22/5/2023

Accepted date: 23/6/2023

Abstract

The research objective is to define the adopting level of technologies and agricultural extension by farmers in cultivating potatoes in Al-Ghoba Region- Nineneveh Governorate, to know the level of adopting technologies and agricultural guidance for farmers in cultivating potatoes in Nineveh governorate measured by every research item and to find the correlation between the adoption of technologies and extension in planting potato with the independent variables of research. The society included all (500) potato farmers and a small random sample was chosen, representing (20%) of them. The final research sample was (100) farmers. Results showed, that level of adopting technologies and guidance was medium tends to be high, and the results had shown that the following variables (age, years of expertise, source of agriculture information) played an important role in accepting farmers for technologies and agricultural extension for growing potatoes.

Keywords: Adoption, Information. Knowledge, Potato, Level.



Introduction

Potato is an important strategic crop. Comes in 4th place after wheat, rice, and yellow corn, productively speaking. It has an economic value in Iraq among all other Nutrition crops (1 and 2). The agricultural sector in general, crops in particular are considered an important section of Iraq's national income in addition to providing food for citizens. Iraqi state realizes such importance, so it prepared developing programs to have integrated agriculture. Way to realize such goals is by introducing modern technologies to farmers to increase production. Technological breakthroughs decrease risks of agriculture products such as pesticides and changes in prices (3, 4, and 5). Scientists assure that agricultural development is a major issue of the current time set by scientific and technological advances. Since agricultural information technology and knowledge are key elements of agricultural development, therefore any lack or ignorance in their use will affect production elements (6 and 4). Technological advance is a key element to increasing agricultural production and crops such as potato, this development could become a reality by adopting many methods and means like automated agriculture, fertilizers, pesticides, packing and storing means, etc. (7 and 8). Agricultural guidance plays an important role in this field, delivering new agricultural technologies and information that coincide with farmers of various crops; such as potatoes. New technologies cannot play a role in increasing the productivity or well-being of producers in rural places unless delivered to farmers

and teaching them how to use these technologies (9 and 10). The system of agricultural extension in the Ministry of Agriculture became the link between Ministry and farmers through providing guidance services, providing new agricultural techniques to farmers, as well as agricultural necessities, teaching farmers about treatment ways, and how to use technologies in this field, create an atmosphere of trust between farmers and guidance centers that are spread all over the country (11), (1). Recently in Iraq and Nineveh governorate, there are a big decrease in production per dunam. This equation leads to an increase in imported potatoes to cover the shortage of local production to meet the actual consumption level (12). Reasons for low productivity of crops in Iraq are the results of many causes such as ignorance of information and technologies of agricultural processes like fertilizing, pesticides, and fighting weeds, not using modern agricultural ways, regular irrigation, scarcity of good seeds high prices; The last two reasons are regarded important factors to increase productivity not to forget to mention poor agricultural guidance services in the region (13, 11, and 14). Due to all the above-mentioned reasons, the researcher chose potato farmers in Nineveh Governorate/Al-Ghoba Region to be the subject of his research, to know the degree of adopting guidance and modern technologies by potato farmers.

The Objective of Research

The study were including the following below:



1. Define the level of adopting technologies and guidance by farmers in cultivating potatoes in Al-Ghoba region / Nineveh Governorate in general.
2. Set the level of adopting technologies and guidance by farmers in cultivating potatoes

in Nineveh governorate measured by every item of research.

3. Know correlation between the level of adopting technologies and guidance regarding planting potatoes and the independent variables of research.

Materials and Methods

- Society and Sample of research:

The research was executed in the Al-Ghoba region / Nineveh governorate where many farmers cultivating potatoes live. Society was all (500) potato farmers, from which, a small random sample had chosen representing (20%). The final sample of the research was (100) farmers.

- Design of tool research:

To collect data from potato farmers, a questionnaire was used. It consisted of two parts:

First: Contains a number of independent variables related to potato farmers such as (Age, academic level, years of experience in planting potatoes, kind of land used for cultivating, sources of information in cultivating potatoes, and purpose of cultivating potatoes).

Second: It consists of some items regarding the cultivation of potatoes, from the planting stage till the harvest (preparing the land to plant, fertilizing, restricting). Items were (20), all of which related to potatoes.

- Measuring Research Variables:

A. Measuring Independent variable:

1. Age: measured by years when the data were collected.

2. Academic level: measured academic levels of farmers (does not read and write, reads and writes, graduate from primary school, secondary school graduate, intermediate school graduate, a graduate of the college of agriculture). Each item was graded (1, 2, 3, 4, 5, and 6) respectively.

3. Years of an expert in farming potatoes: calculating years spent in farming potatoes.

4. Kind of land used for farming: Measured by referring to the type of land used for planting potatoes (estate, contract, rent). Every kind of graded (1, 2, and 3) respectively.

5. Source of agricultural information: Measured through the source of information on how to plant potatoes (agricultural branch in the region, distinguished farmers, agricultural bulletins, colleges, of agriculture).

6. Purpose of growing potato: Measured through these levels: family consumption sell at market. Every item was graded (1, 2).

- B. Measured independents variable (level of adopting information and technology and guidance in planting potatoes):



Measured by a scale of four alternatives (greatly adopt, moderately adopt, rarely, never adopt) graded (4,3, 2, and 1) respectively. a final degree of each farmer should be obtained by collecting responses from farmers on each item, representing at the same time level of adopting potato farmers in Nineveh Governorate guidance and modern technology techniques.

- Collecting data:

A questionnaire collected data from farmers in the Al-Ghoba region, lasting from (2/11/2022 until (2/11/2022).

5. Statistical means:

Many statistical means are used to analyze data statistically such as:

1. Ratio
2. Repetitions.
3. Pearson conjunction factor.
4. Spearman–Brown equation.

Results and Discussion

1. Degree of adopting modern technologies and information by farmers in cultivating potatoes in Al-Ghoba region / Nineneveh Governorate in general:

Results showed the highest value obtained of potato farmers in general was (78), and the least was (30) with an average of (54), farmers were divided into three types regarding their adoption of guidance and modern techniques as shown in Table (1).

Table 1. Distribution of farmers according to the adoption of farmers for modern technologies and information in general.

Categories	Number	%
(30-45) low	25	25
(46-61) medium	40	40
(62-78) high	35	35
Total	100	100

Table (1): Showed that the highest rate of potato farmers was in the middle category (46-61) forming (40%), meaning that the level of adopting modern technologies and information is medium with a bias toward high. This may be because potato farmers are open to adopting and accepting modern

Technologies and information regarding cultivating potatoes.

2. Set level of adopting modern technologies and information by farmers in cultivating

potatoes in Nineveh governorate measured by every item of research:

Table 2. Distribution of farmers according to their adoption of guidance and modern techniques measured by every items of research.

Items	mean	series
I adopt up-to-date information in fertilizing potato	3.70	1
Adopt up-to-date information regarding fighting pests affecting potatoes.	3.60	2
Use the best way to prevent diseases of potato	3.44	3
Adopt up-to-date information about how many times to kill weeds	3.22	4
I follow guidance timing to remove weeds	3.10	5
Follow guidance directions when adding organic fertilizer to potatoes.	3.08	6
I follow guidance directions regarding adding chemical fertilizers for potatoes.	3.02	7
I follow up-to-date methods in farming potatoes.	2.90	8
Follow the most modern guidance directions in preparing the soil to farm potato	2.85	9
Follow up-to-date guidance directions regarding irrigation water.	2.75	10
Follows newest guidance directions regarding around of irrigation water.	2.70	11
Follow the guidance directions regarding choosing the best type to farm.	2.68	12
Regarding appropriate timing in farming potato	2.61	13
Follow the recommendations for planting each potato type.	2.59	14
Know the characteristics of each potato type.	2.55	15
Follow guidance directions regarding harvest.	2.22	16
Follow guidance directions regarding times to harvest.	1.90	17
Follow guidance directions regarding storing potato.	1.85	18
Follow appropriate directions when moving crop to market	1.80	19
Know characteristics of means of transportation of potato crop to market.	1.77	20

Table (2): Showed that the highest-ranking items were (I adopt update information in

fertilizing potato, I adopt up-to-date information regarding fighting pests affecting potato). This shows that potato



farmers have the knowledge and are familiar with this information. However, items that came in last places (knowing characteristics of means of transporting potato to markets, following appropriate directions in transporting the crop to market). This means that the farmers have Information on the conditions of means of transporting potatoes to markets.

3- Know the correlation between the level of adopting modern technologies and information in planting potatoes and independent variables:

1. Age: Results showed that the biggest age was (61) years and the least was (29) with an average of (45) years. Farmers are divided into three categories according to age, as shown in table (3).

Table 3. Distribution of farmers according to their age and its relation to their adoption of modern technologies and information.

Categories (age)	Number	%	Pearson conjunction factor
(29-39) low	35	35	0.02*
(40- 50) medium	30	30	
(51- 61) high	35	35	
Total	100	100	

Table (3) showed the highest percentage was in the low category (29-39) representing (35%). The middle category (40-50) represented (30%) high category (51-61) represented (35%). Results showed a morally significant relation between the adoption of potato farmers for modern technologies and information and age available. Pearson conjunction factor was (0.02*), moral at (0.05) level, meaning that

age of farmer is related to adopting modern technologies and information in cultivating

Potato. That is mean, as the farmer ages go more, this will increase his adoption for agricultural techniques in growing the potato crop.

2. Academic level:

Potato farmers divided into categories according to their academic level in adopting modern technologies and information as shown in table (4).

Table 4. Distribution if farmers according to their academic level and their adoption of modern technologies and information.

Categories	Number	%	correlation factor of Spearman
Don't read and write	8	8	0.129
Read and write	17	17	
Primary school graduates	15	15	
graduates of secondary school	25	25	

graduates Intermediate school	23	23	
Graduate of college of agriculture	12	12	
Total	100	100	

Table (4) showed that the highest rate of farmers was among graduates of secondary school, representing (25%). The categories (Does not read and write) were less than (8%). Results, also showed there is no correlation between the adoption of farmers for modern technologies and information and their academic level. The rank correlation factor of Spearman was (0.129) immoral. Meaning that adopting modern technologies and information may not rely

on the academic level of farmers but on other factors.

3. Years of experience in farming potatoes:

Results indicated that the highest number of years of experience in farming potatoes was 26 years, least was 6 with an average of (17) years. Farmers are divided into categories according to years of experience as shown in table (5).

Table 5. Distributing potato farmers into categories depending on their adoption of modern technologies and information and its relation to years of experience in cultivating potatoes.

Categories (year)	Number	%	Pearson conjunction factor (rs)
(6-12) low	20	20	0.03*
(13-19) medium	50	50	
(20-26) High	30	30	
Total	100	100	

Table (5) showed that the highest value of subjects fell in the middle class (13.19) representing (50%). High expertise was less than (30%). Results showed a moral conjunction factor between adopting modern technologies and information and years of

Experience in planting potatoes. The rank conjunction factor of Spearman was (0.03*) moral at (0.05) level.

4. Kind of land used for farming:

Potato farmers were divided according to the Kind of land used for planting potatoes into the following categories shown in Table (6).

Table 6. Distribution of farmers into categories according to kind of land used for farming and its relation to adopting modern technologies and information by farmers.

categories	Number	%	factor of spearman correlation (rs)
Estate	15	15	

Contract	45	45	0.085
Rent	40	40	
Total	100	100	

Table (6) showed that the highest value was in (contract) which represented (45%), and the estate category represented (15%). Results also showed no morally significant correlation between the level of adoption of modern technologies and information by farmers

and the Kind of land used for farming. The rank correlation factor of Spearman was (0.085) immured.

5- Sources of agricultural information:

Potato farmers were categorized according to their source of agricultural information about potatoes as shown in Table (7).

Table 7. Categorizing farmers according to their source of agriculture information about potato.

Categories	Number	%	correlation factor of Spearman
agricultural branch in the region	40	40	0.004
Distinguished farmers	30	30	
Agriculture bulletins	20	20	
Colleges of Agricultural	10	10	
Total	100	100	

Table (7) showed that the highest number of respondents happened to be in (agricultural branch in the region) representing (40%). Colleges of Agricultural represented less than (10%). Results showed a morally significant correlation between the level of adopting modern technologies and information in farming potatoes. The rank

correlation factor of spearman was (0.04) which was moral.

6- Purpose of growing potatoes:

Farmers are divided into categories according to the purpose of cultivating potatoes as shown in Table (8).

Table 8. Categorizes respondents according to their adoption of modern technologies and information and purpose for planting potato

Categories	Number	%	correlation factor of Spearman (rs)
Domestic consumption	60	60	0.065-
For selling in market	40	40	
Total	100	100	

Table (8) shows that the highest number was in the category of (domestic consumption) representing (60%). While the category (for selling in the market) represented (40%).

Results showed no morally significant correlation between the adoption of modern technologies and information and the purpose of farming. The rank correlation factor of Spearman was (0.065-) insignificant.

Conclusion

Results showed that adoption of modern technologies and information by potato farmers is moderate and tends to rise.

References

- 1- **Al-Khafije, M. O. J. 2014.** Knowledge of protected vegetable growers belonging to and not belonging to farmers' schools in some field of integrated pest management in Mahaweel district, Babylon province, unpublished higher diploma thesis, College of Agriculture, University of Baghdad. Republic of Iraq.
- 2- **Muhinyuza, J. B. 2022.** Participatory Assessment of Potato Production Systems and Cultivar Development in Rwanda. *Sustainability*, 14, 16703
- 3- **Sedeeq, A.O., M. T. Saleh and Ali, S. 2022.** An investigation into the effect of using different harvesting methods on the indicators of Potato crop loss. *Mesopotamia Journal of Agriculture*, 50(3): 19-26.
- 4- **Alhafidh, A. Z. 2019.** Farmers' knowledge level of potato crop cultivation, in Rabia sub-district, Nineveh governorate. *Mesopotamia Journal of Agriculture*, 47(1): 1-12.
- 5- **Murad, H. 2020.** The level of knowledge of agricultural staff in the province of Duhok in the field of integrated management of agricultural pests, *Mesopotamia J. of Agric.*, 48(2), Page 1-14.
DOI:10.33899/MAGRJ.2020.12659
2.1022
- 6- **Abdullah, A. M. and H. Abdul Aziz. 2021.** Reasons for the reluctance of farmers to practice the profession of agriculture in the district of Zwaya/ province of Salah al-Din, *Mesopotamia Journal of Agriculture*, 49(1): 104-119.
DOI:10.33899/MAGRJ.2022.13335
0.1168



- DOI:10.33899/MAGRJ.2021.129042.1098
- 7- **Haverkort, A. J. S. P.C. 2015.** Yield levels of potato crops: recent achievements and future prospects. *Field Crops Research*, 182: 76-85.
 - 8- **Khalef, B. J. 2015.** The importance of government's role in the developing of agricultural research centers and its reflection on Iraqi agricultural production, *Journal of College of Baghdad for Economic Sciences*, 44:123-133.
 - 9- **Al-Douekhi, A. H. M. 2018.** The application level of Wheat farmers (class Sham 6) for scientific recommendations that related with crop cultivation in the Tikrit district - Salahuddin governorate. Master thesis, College of Agriculture, University of Tikrit, Republic of Iraq.
 - 10- **Ahmed, A. A. 2014.** Trends in vegetable cultivation towards some sustainable farming practices in Nimrud district of Nineveh province and its relationship to some variable. *Mesopotamia Journal of Agriculture*, 48(1): 1-8.
DOI:10.33899/MAGRJ.2014.88439
 - 11- **Al-Aboudi, A. J. 2014.** Participation of agricultural researchers and extension staff in the generation and dissemination of agricultural technologies for crops in Iraq, unpublished doctoral dissertation Faculty of Agriculture, Cairo University, Egypt.
 - 12- **Alhayali, A. R. D. 2020.** The role of agricultural extension centers in rural development in Iraq, *Mesopotamia Journal of Agriculture*, 48(4): 62-74.
DOI:10.33899/MAGRJ.2019.161240
 - 13- **Hassen, A. A. M. 2015.** Basics and Technology of Production of Vegetable, Dar Al-Kutab for Publishing and Distribution. Faculty of Agriculture. University of Cairo. Egypt.
 - 14- **Abd Al-Razzaaq, A. H. 2015.** Attitudes of farmers of protected vegetable crops in Waist province towards practicing environmentally friendly agricultural methods and its relationship to some variables, *Al-Furat Journal of Agricultural Sciences*, Appendix No. 4, College of Agriculture. University of Waist. Republic of Iraq.
 - 15- **Dongyu, Q. 2017.** Role and Potential in Global Food Security. Food and Agriculture Organization of the United Nations.

