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APPLICATION LEVEL OF DRIP IRRIGATION TECHNOLOGY BY THE VEGETABLE GROWERS IN ALQOSH DISTRICT/ NINEVEH

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ABSTRACT

The research aims to measure the level of application of drip irrigation technology by vegetable farmers in Alqosh district/Nineveh Governorate, and identify the correlation between the level of application of drip irrigation technology by vegetable farmers and some independent variables. The research community included all the vegetable farmers in Alqosh district, who numbered 200 farmers. A simple random sample of them was taken by 60%, thus bringing the number of respondents to 120 farmers. A questionnaire was prepared consisting of three parts, the first part included the independent variables (age, educational level, land area, tenure, training courses). the second part, it included a scale to measure the level of farmers' application of the drip irrigation technology, and it might consist of 21 items, while the third part included 10 problems that hinder the application of the drip irrigation technology. The data were collected by the personal interview method. After that, the data was emptied for the purpose of statistical processing using the Spss program. The results showed that 64% of the respondents had a medium level of application. The results also showed that there is a significant correlation between the independent variables (age, educational level, tenure and training courses) and the level of application. while there is no significant correlation between the land area and the level of application, as it was found that the problem of clogging the nozzles with suspended materials, sediments and salts ranked first with an average of (3.533).

INTRODUCTION

Agricultural development is considered one of the important pillars in the process of economic and social development, and its importance appears especially in developing societies that depend on the agricultural sector in the national economy and achieve high levels of production (Saleh *et al.*,2004). Increasing the gap between food production and food needs in most developing countries requires an increase in agricultural production in line with the increase in demand for agricultural commodities. The increase in agricultural production is achieved through the vertical expansion of the limited arable land in most developing countries (Dahsh, 2013). The shift from traditional agriculture to advanced agriculture and the replacement of traditional patterns with modern ones based on scientific and knowledge bases resulting from scientific research in the field of agricultural production development

depends mainly on the extent to which farmers accept and continue with them (Ahmed, 2016). Since agricultural production has several basic and important elements that cannot be dispensed with, such as fertile land, a good climate and the availability of water. Water is the main element of life, being the mainstay for the continuity of life and its progress, and consequently the development of living and the events of agricultural and economic development.

Therefore, countries have taken care of water projects and recommended the application of modern irrigation methods to save water and reduce waste. Successive governments have focused on increasing the awareness of vegetable farmers on rationalizing water consumption and reducing waste by increasing their knowledge and skills by using modern irrigation techniques (Jawdat, et al., 2016). The most important and most serious obstacles are the scarcity of water, as fresh water is a scarce resource, and the water problem is a global problem, as 97% of the world's water is saline water unsuitable for irrigation, and the proportion of fresh water represents 3% distributed over the globe in the form of ice, as in the poles. The rest of it is irregularly distributed to other parts, where places are characterized by high flow and availability of water and poor, dry and semi-arid areas. With the increase of the population, the daily need for fresh water increased (Al-Tai and Khaled, 2013). Perhaps the main reasons for the decline in water security is the excessive use of water, as well as the evaporation of large quantities of water as a result of the old traditional methods used in irrigation, and economic conditions also play a role, as weak infrastructure constitutes an obstacle to accessing the available water resources, and all this affects food security, decreases agricultural productivity and increases poverty. (Farhan, 2017). The lack of clear rationing in the management of water resources is the most serious problem, especially in agricultural irrigation, so it is necessary to apply the best modern irrigation techniques appropriate to agricultural conditions in dry areas (Shaqlab *et al.*,2006).

The application of drip irrigation technology can help farmers achieve such economic strategies in areas that suffer from a lack of irrigation water, reduce the quantities of water used for irrigating crops, increase the productivity of agricultural crops, and achieve integrated agricultural development (Farhan, 2017). Agricultural extension plays a major role in transferring modern methods and knowledge for use in agriculture (Al-Rimawi, *et al.*,1995), and farmers have a complementary role, as they have the responsibility to adopt and apply these modern methods and use them correctly in order to benefit from them as much as possible (Abdullah and Amin, 2016). Achieving agricultural development and shifting from traditional production methods to modern production methods (Saleh and Atanoubi, 2004). Therefore, agricultural extension should work to support farmers in applying modern technologies in general and drip irrigation technology in particular, through carrying out various extension activities that highlight the advantages of drip irrigation and its importance in reducing water waste (Al-Khouli, 1997). Where the research aims to measure the level of application of drip irrigation technology by vegetable farmers in Alqosh district / Nineveh Governorate by designing a special questionnaire in order to collect data and reach the desired results. Reducing the application of traditional farming methods, which hardly meet the needs of the population, and heading to the application of advanced farming methods that enable the production of agricultural

crops satisfy many of the desires of the population of the community (Al-Jibouri and Mahmood, 2019).

RESEARCH OBJECTIVES

1- Identifying the level of application of vegetable farmers on the drip irrigation technique in Alqosh district.
2- Identifying the correlation relationship between the level of application of vegetable farmers and each of the variables (age, educational level, land area, type of tenure, previous training).
3- Identify the most important problems that hinder the application of drip irrigation technology.
4-

MATERIALS AND METHODS

The descriptive approach was depended on conducting the current research because it is appropriate to identify the factors associated with the level of application of vegetable farmers for drip irrigation technology. The research community included all the 200vegetable farmers in Alqosh district. A simple random sample of %60was taken from them, thus the research sample amounted to 120farmers. A questionnaire was prepared to measure the level of farmers' application of drip irrigation technology, consisting of three parts. The first part included identifying the independent variables (age, educational level, land area, type of tenure, training courses), and the second part included (21) items to measure the level of application. On a quadrilateral scale, four alternatives were allocated (applied with a big degree, applied with a moderate degree, applied with a small degree, not applied) and the weights were assigned to them (1,2,3,4) degrees and respectively, and the total degree of the scale reached between (21-84) degrees. The third part included identifying the most important problems that hinder the application of drip irrigation technology. The following alternatives were developed to measure them (big problem, medium problem, small problem) and the following alternatives were allocated to them (3, 2, 1) respectively. In order to achieve the content validity, the questionnaire form was presented to a number of professors in the field of soil and water sciences and department of Agriculture Extension.& Technologies Transfer in the College of Agriculture and Forestry at the University of Mosul to determine the content and face validity of the items and their suitability for the respondents. A preliminary test was conducted on a sample of (30) farmers from outside the research sample, who were randomly selected to measure the scale's reliability coefficient, using Cronbach's alpha, as the Reliability value reached (0.866), and the Reliability coefficient is considered good if it is not less than (70.0). (Allam, 2009: 711).

MEASURING INDEPENDENT VARIABLES

-Age: It was measured by the years of the respondent's age at the time of collecting the research data.

- Education level: Measured through the following levels: (Illiterate, Read and Write, primary, secondary, Institute, and College) These levels were given the following numerical values (1,2,3,4,5,6), respectively.

-Land area: measured by the number of dunams who owns the farmer

-**Type of tenure:** This variable was measured by dividing it into four categories as follows (owning, contracting, renting, sharing) and the following weights were assigned to these levels (1, 2, 3, 4) respectively.
-Previous training: The respondents were classified according to their participation in the training into two categories (yes, no), and numerical values were assigned to them, which are (2,1) respectively, in addition to the number of sessions they participated in if they answered by participation.

RESUITS AND DISCUSSION

The first objective: to identify the level of application of vegetable farmers on the technique of drip irrigation in Alqosh district.

The results of the research showed that the degrees of application level of the respondents were between (42-84) degrees on a scale that reached the highest degree (84) and the lowest (21) as the respondents were divided into three categories as in Table (1)

Table (1): The level of respondents' application of drip irrigation technology.

Classes (application level)	Frequency	percentage
(42-56) low	19	16%
(57-71) medium	77	64%
(over than72) high	24	20%
	120	100%

The Table 1 shows that nearly two-thirds of the respondents have a medium level of application, and perhaps the reason for this is due to the importance of water, and it is necessary to use a technique to rationalize the use of water.

The second objective: Identifying the correlation between the level of application of vegetable farmers and each of the variables (age, educational attainment, land area, type of tenure, previous training).
1- Age: It was clear from Table (2) that the lowest age of the respondents was (24) years and the oldest age was (66) years, and they were divided into three age groups: the young age Category (24-38) years amounted to 31%, while the middle age Category (39-52) years at a rate of 48%, and the age Category (and over 53-) is 21%, and to find the correlation between the level of application and age, Pearson's correlation coefficient was used, where the value of the correlation coefficient was (0.224), which is significant at the level (0.05). It indicates the existence of a correlation between the two variables, so the research hypothesis is rejected, which states that there is no correlation between the two variables, and this may be due to the impulsiveness, vitality and activity of young and middle-aged farmers that may be a reason for their higher level of application compared to older farmers.

2-Education level: Table (2) shows the division of the respondents according to academic achievement into six categories, the first category (Illiterate 8%), the second category (read and write 5%), the third category (primary graduate 41%), the

Table (2): Correlation relationship between application level and independent variables.

Variables	Classes	Number	Percentage	Coefficient of correlation	Significant level
Age	(24-38) year	37	31	0.024-	0.05
	(39-52) year	58	48		
	(more than 53)	25	21		
Academic achievement	Illiterate	10	8	0.0259**	0.01
	Read and Write,	6	5		
	Primary	49	41		
	Secondary	29	24		
	Preparatory	12	12		
	College	14	10		
Land area	(2-35)	88	73	0.0385	no sig
	(36-69)	27	23		
	(more than 70)	5	4		
type of tenure	Own	35	29	0.0328**	0.01
	Contract	40	33		
	Rent	18	15		
	Shar	27	23		
Previous training	Participated	42	35	0.0378**-	0.01
	Not participated	78	65		

fourth category (secondary graduate) 24%), the fifth category (preparatory graduate 12%), the sixth category College (105%), and this indicates that (41%) of the respondents are from the category of primary school graduates, which is the highest percentage of the total sample and to find the correlation between the level of application and the achievement variable The Spearman correlation coefficient was used, and its value was (0.259), which is significant at the level (0.01). This indicates the existence of a correlation relationship between the two variables, so the research hypothesis is rejected, which states that there is no correlation between the two variables, and perhaps the reason for this is that the more educated farmers are more understanding, aware and conscious, and this prompts them to develop their information and knowledge and learn about modern methods used in agriculture and the application of all modern and advanced techniques, especially drip irrigation technology.

3-Land area:

The variable was divided into three categories, the small area category (2-35) was 73%, the medium area category (36-69) was 23%, and the large area category (70- and more) was 4%, and to find The correlation relationship between the application level and the land area variable, Pearson's correlation coefficient was used, and its value was (0.03), which is not significant.

4-**Type of tenure:** The variable was divided into four categories of holding, the category of ownership (35) at a rate of 29%, the category of rent (40) at a rate of 33%, the category of contract (18) at a rate of 18%, and the category of participation (27) at a rate of 23%, and to find The correlation relationship between the level of application and the variable of possession.

The Spearman correlation coefficient was used, whose value was (0.328**), and it is significant at the level (0.01). Thus, the research hypothesis that states that

there is no correlation between the two variables is rejected, and this may be due to the fact that the farmer who owns or rents agricultural land always seeks to increase the productivity of the land he uses in agriculture, for the purpose of paying the costs of the land and cultivating it, or because he uses the land for a limited period and tries Maximizing profits and this is achieved through the correct use of pesticides for the purpose of controlling agricultural pests that infect cultivated fields to increase agricultural production.

5-Training courses:

Table (2) shows the distribution of respondents according to their participation in training courses into two categories, where the percentage of respondents participating in training courses reached 35%, while the percentage of respondents who did not participate in training courses reached 65%, and to find the correlation between the level of application And the variable of training courses, the Pearson correlation coefficient was used, which reached (0.378), which indicates the existence of a significant correlation at the level (0.01). Thus, the research hypothesis, which states that there is no correlation between the two variables, is rejected. This is due to the lack of specialized training courses in the field of drip irrigation. Perhaps the reason for this is that the lack of training courses has contributed to the lack of farmers' information, knowledge and experience in agricultural issues in general and technology. Especially drip irrigation. This led to the respondents' lack of practical experience in how to apply this technology in their fields, as well as their ignorance of the great economic benefits of this technology.

Table (3):Arrangement of problems facing the application of drip irrigation technology from the point of view of vegetable farmers in Alqosh district / Nineveh governorate in descending order according to the respondents' point of view.

Rank	Problems	average
1	Blockage of nozzles with suspended materials, sediments and salts	3.533
2	Irregular distribution of irrigation water due to pressure difference	3.206
3	Short lifespan of drip irrigation system	3.12
4	Waste of time and water if the drip irrigation system is not installed correctly	3.113
5	The pipes used in the drip irrigation process are damaged due to exposure to sunlight	3.073
6	The high cost of construction costs for the drip irrigation network	3.028
7	Lack of technicians, specialists and trainers	3.000
8	Root growth is limited due to lack of water	2.773
9	The possibility of damage to plastic watering pipes by rodents	2.753
10	Plastic pipes affect soil fertility	2.068

The Third objective:

Identify the most important problems that hinder the application of drip irrigation technology.

For the purpose of identifying the most important problems facing the application of drip irrigation technology from the point of view of vegetable farmers in Alqosh district / Nineveh Governorate, and arranging them according to their importance

from their point of view in descending order. The results showed the arrangement of the problems as shown in the table (3).
It is clear from the table (26) that the problem of (clogged nozzles with suspended substances, sediments and salts came in the first place with an average of (3.533) and this may be the reason for that, as (plastic pipes affect soil fertility) came in the last rank with an average of (2.068) and this appears.

CONCLUSIONS

We conclude from the average level of farmers' application of drip irrigation technology that agricultural extension has played a large and vital role in guiding farmers to this technology. We also conclude that most of the farmers were of middle age, and education has a major role in helping the respondents apply modern agricultural techniques, including drip irrigation technology, as well as the importance of participating in training courses in educating farmers and increasing their awareness and practice of these techniques.
the researcher recommends The necessity of providing material and moral support to vegetable farmers by the Ministry of Agriculture and the General Company for Agricultural Supplies so that they can acquire drip irrigation systems. The need to work on finding scientific solutions to the problems that accompany the application of drip irrigation. Working to increase the material and moral support for vegetable farmers from the Ministry of Agriculture and the General Company for Agricultural Supplies.The need to work on finding scientific and practical solutions to the problems that accompany the application of drip irrigation technology.

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CONFLICT TO INTEREST

The Authors declare that there is no conflict of interest.

مستوى تطبيق تقنية الري بالتنقيط من قبل مزارعي الخضار في قضاء القوش / نينوى

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الخلاصة

يهدف البحث إلى قياس مستوى تطبيق مزارعي الخضر لتقنية الري بالتنقيط فـــي ناحية القوش/محافظة نينوى، والتعرف على علاقة الارتباط بين مستوى تطبيق مزارعي الخضر لتقنية الري بالتنقيط وبعض المتغيرات المستقلة. شمل مجتمع البحث جميع مزارعي الخضـراوات في ناحية القوش والبالغ عددهم 200 مزارع تم اخذ عينة عشوائية بسيطة منهم بنسبة 60% وبذلك يصبح عدد المبحوثين 120 مزارعاً. تم اعداد استمارة استبيان

مكونة من ثلاثة أجزاء الجزء الأول شمل المتغيرات المستقلة (العمر، التحصيل الدراسي، مساحة الأرض، الحيازة، الدورات التدريبية) ، اما الجزء الثاني شمل مقياس لقياس مستوى تطبيق المزارعين لتقنية الري بالتنقيط وقد تكون من 21 فقرة ، فيما شمل الجزء الثالث 10 مشكلات تعيق تطبيق تقنية الري بالتنقيط ، جمعت البيانات بطريقة المقابلة الشخصية . وبعد ذلك فرغت البيانات لغرض معالجتها احصائيا باستخدام برنامج Spss وقد أوضحت النتائج ان64% من المبحوثين مستوى تطبيقهم متوسط، كما اوضحت النتائج ان هناك علاقة ارتباط معنوية بين المتغيرات المستقلة (العمر، التحصيل الدراسي والحيازة، والدورات التدريبية) ومستوى التطبيق، فيما لا توجد علاقة ارتباط معنوية بين مساحة الأرض ومستوى التطبيق ، كما تبين ان مشكلة انسداد النوزلات بالمواد العالقة والرواسب والأملاح احتلت المرتبة الأولى وبمتوسط حسابي(3.533). يوصي الباحث الى زيادة الدعم المادي والمعنوي لمزارعي الخضر من ووزارة الزراعة والشركة العامة للتجهيزات الزراعية.

الكلمات الدالة: مزارعي الخضار ، الري بالتنقيط ، مستوى التطبيق ، معرفة المزارعين.

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