The spreading level of Herbicides and applying their scientific recommendations in cultivating wheat crops in Al-Mahawil District / Babylon province

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ABSTRACT

Herbicides are considered among the modern technologies spread in controlling wheat weeds. Therefore, the research aims to identify the spreading level of Herbicides and applying their scientific recommendations in cultivating wheat crops in Al-Mahawil District / Babylon province for the three agricultural seasons (2013/2014-2015 /2016). To achieve the aim of the research, a scale of 10 paragraphs was prepared dividing into 2 axes. Data were collected from a randomly proportioned sample of 75 farmers in Al-Mahawil District, through a questionnaire using the interview method. The presence of a large and important role for the private sector through the local agricultural offices in the process of supplying wheat Herbicides to farmers in terms of quantity, quality and timing, which effectively contributed in the process of spreading chemical Herbicides among farmers, and positively impacting the increase in productivity, wheat production and economic income for farmers in Al-Mahawil District. The research showed several recommendations, including:

Developing an appropriate strategy that includes the participation of the private sector with the government sector in the process of preparing chemical Herbicides, including wheat Herbicides of wheat for farmers in terms of quantity, quality and timing through the Agricultural Supplies Company and its cutting centers, to ensure the spread of chemical Herbicides between farmers, increasing productivity, wheat production, farmers income, and national economic income.

Keywords: Spreading, applying scientific recommendations, Herbicides, wheat crop.

مستوى انتشار مبيدات الادغال وتطبيق توصياتها العلمية في زراعة محصول الحنطة في قضاء المحاويل / محافظة بابل

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> > الملخص

تعد مبيدات الادغال من التقانات الحديثة المنتشرة في مكافحة ادغال الحنطة. لذلك هدف البحث إلى التعرف على مستوى انتشار مبيدات الادغال وتطبيق توصياتها العلمية في زراعة محصول الحنطة في قضاء المحاويل/محافظة بابل للمواسم الزراعية الثلاثة (2013/2014) - 2015 2016). وتحقيقاً لهدف البحث ، أعد مقياس تكون من 10 فقرة موزعة على 2 محور. وجمعت البيانات من عينة عشوائية تناسبية مقدارها 75 زارعاً في قضاء المحاويل بوساطة استبانة بطريقة المقابلة. وقد خلص البحث إلى أن 100% من ما فقرة موزعة على 2 محور. وجمعت البيانات من عينة عشوائية تناسبية مقدارها 75 زارعاً في قضاء المحاويل بوساطة استبانة بطريقة المقابلة. وقد خلص البحث إلى أن 100% من 10 فقرة موزعة على 2 محور. وجمعت البيانات من عينة عشوائية تناسبية مقدارها 75 زارعاً في قضاء المحاويل بوساطة استبانة بطريقة المقابلة. وقد خلص البحث إلى أن 100% من المحوثين يوصف مستوى انتشار مبيدات ادغال الحنطة وتطبيق توصياتها العلمية بالجيد. وقد خرج البحث باستنتاجات منها : وجود دور كبير ومهم للقطاع الخاص عن طريق المكاتب الزراعية المحلية في عملية تجهيز مبيدات أدغال الحنطة للزراع كماً ونوعاً وتوقيتاً ، والذي ساهم بشكل فاعل في عملية نشر المبيدات الكيميائية بين صفوف الزراع ، والتأثير إيجاباً في زيادة الإنتاجية وإوتقيتاً عامية الحنوبية وي ولي الحنطة للزراع كماً ونوعاً وتوقيتاً والذي ساهم بشكل فاعل في عملية نشر المبيدات الكيميائية بين صفوف الزراع ، والتأثير إيجاباً في زيادة الإنتاجية وإنتاج الحنطة والذي الخلال وقد خرج البحث بتوصيات عدة منها: تطوير استراتيجية مناسبة تضمن مشاركة القطاع والدخل الاقتصادي للزراع في قضاء المحاويل. وقد خرج البحث بتوصيات عدة منها: تطوير استراتيجية مناسبة تضمن مشاركة القطاع والذل الاقتصادي للزراع في قضاء المحاويل. وقد خرج البحث بتوصيات عدة منها: تطوير استراتيجية مناسبة تضمن من هنا في زيام من ما قوي والدخلة الخلق الخلقة والذل الاقتصادي للزراع في قضاء المحاويل. وقد خرج البحث بتوصيات عدة منها: تطوير السرالتيجية مناسبة تضمن ما من والذل الخلقة للزراع وي قلونوعاً ونوعاً وي من ما من والذل الخلقة للزراع وريا والغوي والمناية ورمين ما منون مما الخاص مع القطاع الحكومي في عملية تجهيز المبيدات الكيميائية ومنها مبيدات ادغال الحنطة للزراع وزياة ولويئا. ورمن ما مريق مممان مركة القبي والخان والغوي والميم

كلمات مفتاحية : أنتشار ، تطبيق التوصيات العلمية ، مبيدات الادغال ، محصول الحنطة.

1. INTRODUCTION

Wheat is considered one of the most important agricultural crops in the world in terms of cultivated area, production, trade. and consumption, and food for more than two-thirds of the world's population who live in 40 countries and represent 35% of the world's population (19). The FAO estimates the food supplying of grains to the world's population. In 2020, the world needs approximately 20 billion tons of wheat to meet its requirements compared to the current production, which does not exceed 800 million tons, which requires intensifying efforts to increase production vertically and horizontally (17). Wheat is the first strategic crop in Iraq, where the cultivated area with the crop amounted to (3697246 dunums) in the agricultural season (2015/2016), with a total production amounted to (3052939 million tons) (4). Iraq faces a large deficit in crop production for more than three decades ago, which forces Iraq annually to import many millions of tons to cover the deficit in crop production that costs millions of dollars annually (11). For example, Iraq imports more than 2 million tons of wheat annually, which represents a heavy burden on the state's general budget (5). The insufficient national production of wheat represents the fragility of food security (22). The aforementioned deficit is due to many causes, the foremost of which is low agricultural productivity (12). Productivity in general means efficient utilization of the available economic materials in the production process, where it is the relationship between the inputs and outputs and the elements used in their production (6). The productivity of a unit area in Iraq is low and represents only 30% of the productivity of the global unit area, so Iraq imports more than two-thirds of its need for wheat (14). The Ministry of Agriculture considered low agricultural productivity, one of the most important challenges facing the agricultural sector in Iraq, which is caused by common and interacted factors. several Perhaps, the most important of them are: salinity and waterlogging soil, especially in the central and southern regions of Iraq, the decline

of field agricultural operations, desertification, the shrinking of rainfed agriculture, the old agricultural mechanization, the lack of chemical fertilizers in quantity and quality, as well as the lack of organic fertilizers (15). According to 2016 data, the average production of wheat in Iraq is (825 kg/dunum) (4), while the average production of wheat in Egypt is (1657 kg/dunum), and in Saudi Arabia amounted to (1566 kg/dunum) (19). The low productivity is considered a productive and economic loss for the agricultural producer, its family, society and the national economy (13). Increasing wheat production in Iraq to achieve self-sufficiency is considered a national necessity and represents one of the main objectives for the Ministry of Agriculture at the current stage, according to its plan for the years (2011-2014) (22). The Food and Agriculture Organization of the United Nations (FAO) studies indicate that the strategy of vertical expansion is the most contributing to achieving an increase in agricultural production in the growing world from a strategy of horizontal expansion and a strategy of crop intensification, with percentage amounted to 66%, In other words, productivity per unit area will play the decisive role in increasing agricultural production during the next few decades (16). Therefore, increasing wheat production in Iraq at the current stage, it is necessary to focus on the priority of vertical expansion. The Ministry of Agriculture, in its plan for the years 2011-2014, confirmed the priority of vertical expansion in increasing agricultural production for most crops and products, especially wheat (23). Agricultural productivity in general and wheat productivity, in particular, are affected by a variety of interacting factors technical. human. environmental, material. administrative, investment ... etc (18). The weeds are considered one of the main problems in most fields and agricultural lands because of the specific characteristics that made it grow automatically, so competing crops in nutrition, water, and lighting, and makes its growth weak, which affects the production of these crops, both in quantity and quality and causes many damages that result in great economic losses in

addition to the difficulty of controlling them. Numerous studies have unanimously agreed that the amount of losses caused by weeds in agricultural lands constitutes (34%) of the total losses that may occur in the agricultural sector in general, which include soil losses, diseases, insects and livestock losses (3). Scientific research indicates that the spread of the numerous and varied weeds in the fields of wheat and barley causes a loss in the productive yield estimated by (40-50%), in addition to being an important repository of many insects and phases purchased from pathogens (7). Studies and statistics showed the amount of large losses that affect the global production of grain crops due to exposure to the weeds, where it is estimated by (55 million tons), with a loss rate of 13% (7). In Iraq, the results of research conducted in research centers indicated that the amount of losses in wheat production as a result of competition for weeds is estimated by (417 kg/dunum), with a loss rate amounted to (45%)(10). The agricultural production in Iraq decreased by about (3.5%) annually during the past 15 years, and the productivity of the major decreased and the agricultural grains development processes did not lead to a significant development in this sector (8). There are more than 30 types of weeds that affect wheat fields (9). For example, it found that the yield of wheat and the number of spikes per square meter decreased as a result of his competition from the wild oat weed with the percentage of (35%) (24). The weeds also had a clear effect on the rate of growth and developing the wheat crop, and the lack of control of these weeds led to a decrease in the number of spikes amounted to $(90.7 \text{ spikes.m}^2)$ compared to a control treatment in which the number of spikes increased to $(314.7 \text{ spikes.m}^2)$ where the control achieves the absence of the weeds competition factor, which provided the opportunity for branches to grow and develop and achieved efficacy in the production of the spike. In addition, it is possible to improve the absorption of water and nutrients and orienting part of them to meet the requirements of the new branches' growth that carry spikes and increase their numbers (2). Therefore, the

prevention and controlling weeds in wheat fields are considered necessary to protect the crop, maintaining its growth and development, achieving the desired productivity, production, and the economic return expected from its cultivation. the prevention from wheat weeds and reducing its damage are affected by many factors, foremost among which is the knowledge of farmers about those weeds, their severity, the importance of prevention, and knowledge to applying correct scientific recommendations for herbicides (27). Here the role of the agricultural extension appears because it is considered a system that facilitates and accesses farmers in the rural community to knowledge, information, and technologies, facilitating their interaction with their sources, and helping them to develop their methods, skills. and practices to improve the management of their agricultural activities (25). Here, it also appears the activity of processing agricultural institutions, especially those concerned with equipping farmers with pure seeds of higher orders and free from seed weeds, as well as equipping farmers with appropriate chemical herbicides (1). Al-Mahawil District is considered one of the agricultural regions in Babylon province, and wheat cultivation is widespread in it, where the cultivated area with wheat is estimated about (12,240 dunums), with good productivity amounted to (1033 kg/dunum) (29). Therefore, the increase in crop productivity in Al-Mahawil region raises the following question:

What is the spreading level of Herbicides and applying their scientific recommendations in cultivating wheat crops in Al-Mahawil District / Babylon province?

Therefore, the study aims to identify the spreading level of Herbicides and applying their scientific recommendations in cultivating wheat crops in Al-Mahawil District / Babylon province.

2. MATERIALS AND METHODS

The research is classified as survey research that falls within the descriptive approach. This research is useful for providing the appropriate data on the reality of the phenomenon or problem to be studied (20). The research community identified by all wheat farmers in the Al-Mahawil Agriculture department which amounted to (2755 farmers) (29). They are distributed into five sectors: Al-Faiha, Babel, AL-Thaeir Al-Arabi, Al-Nassir, and Al-Jihad. A sample of them was chosen, which their total of individuals amounted to (75 farmers), then chosen in a proportional, random manner in several stages, where 50% of the districts belonging to the selected departments were randomly chosen, which amounted to (10 District), namely Dulaimi, Badaa Al-Musayyib, Al-badaa Al-Kabeer, Al-Shetia Al-Saidia, Albadaa Al Sagheer, Al-Tahriya, Al-Azzawi, Al-Mansouri, Al-Bida. The percentage of 7% from the total of 1072 farmers were chosen in all ten districts.

The Agricultural sector	Districts	Number of farmers	Sample amount	Percentage (%)	
Al-Jihad	Dulaimi	80	6	18.66	
Al-Jillau	Badaa Al-Musayyib	120	8	18.00	
	Al-badaa Al-Kabeer	110	8		
AL-Thaeir Al- Arabi	Al-Saidia	90	6	31 67	
	Al-Shetia	120	8	54.07	
	Al-badaa Al Sagheer	60	4		
	Al-Tahriya	70	5		
Al-Nassir	Al-Azzawi	150	11	16 67	
	Al-Mansouri	200	14	40.07	
	Al-Bida	72	5		
Total		1072	75	100	

Table 1: Number	of wheat surveyed	l farmers in the	Al-Mahawil As	priculture department.
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References: It prepared by the researcher

Preparing the scale of spreading wheat crop herbicides and applying their scientific recommendations

The process of preparing and developing a scale for the spreading of wheat crop herbicides and applying its scientific recommendations consisted of three phases, including a set of steps.

The first stage: preparing the scale in its initial form

The scale was prepared in its initial form in light of:

- 1- Agricultural extension bulletins specialized in controlling the weeds of wheat crop.
- 2- The opinions of a group of experts in plant protection, where bulletins and experts are considered an important

source in building standards (21). The scale may be in its primary form, consist of 12 paragraphs, divided into 2 axes.

The second stage: developing scale

1- The scale was presented in its initial form to 13 agricultural experts, four were experts of them in the specialization of agricultural extension and nine of them were experts in the specialization of plant protection, to indicate the degree of their approval to the paragraphs of the scale, using the questionnaire of expert approval. It included all the axes and paragraphs of the scale and the approval gradient phrases in front of each paragraph or axis, which are: agree, agree with the modifications, disagree. The purpose of presenting the scale to experts is to check the Scale's Validity, which is to measure what was set for its measurement, meaning the extent to which the scale achieved the goal for which it was designed, and this is known as Face validity. As for the content validity, it means the extent to which the scale components represent the aspects of the measured axis, that is, the extent to which the set objectives are covered (20).

- 2- Determining the weights for the experts 'approval statements on each axis and paragraph, which determined by the following (3, 2, 0 degrees), respectively for the phrases (agree, agree with the modifications, disagree).
- 3- Determining the approval threshold amounted to 80% from the total grade for the approval scale as a criterion for the axis or paragraph to remain on the scale in its final form.
- 4- Calculating the average degree for approval of the experts on each axis or paragraph, the average degree of approval for the axes amounted to (3)

degrees), and the average degree of approval for the paragraphs ranged between (2.7-33) degrees.

5- Calculating the average percentage of expert approval for each axis or paragraph and comparing it with the threshold. The paragraph or axis that achieved the degree of threshold or more remained on the scale. According to the opinions of measurement experts, the tool is honest if it gets 75% or more (20).

The third stage: preparing the scale in its final form

All axes and paragraphs in the scale in its preliminary form achieved the threshold and more (axes 100%, paragraphs 97-100%).

So they all remained on the scale in its final form, and after reviewing to formulate the axes and paragraphs. Two paragraphs of the scale were deleted based on the experts 'recommendations, making the scale in its final form consist of 10 paragraphs distributed over 2 axes as shown in Table (2).

Table 2: The scale of spreading level for Herbicides and applying their scientific recommendations.

Axis	Sequence	Paragraphs
	1	Using recommended herbicides
	2	Source of herbicides
Chamical harbigidas	3	Quality of herbicides
Chemical heroicides	4	Area controlled by herbicides
	5	Continuity in using herbicides
	6	Damages of herbicides
	1	Type of Chemical herbicides
Applying scientific recommendations for Wheat	2	Amount of Chemical herbicides
herbicides	3	Period of controlling with herbicides

Data collection and analysis

After a preliminary test for the questionnaire was performed on 10 farmers for wheat crops in the Imam Agriculture department. The consistency was calculated using the Split half Reliability method using the Person equation and corrected by the Spearman-Brown equation, where the coefficient of consistency amounted to (0.94). Thus, the questionnaire was formed to become ready to be applied and to achieve the objectives of the research. Data were collected from the respondents by the interview method. The data was collected during the period (1-30 / 10/2016). Percentages, arithmetic means, Frequency distributions, and standard deviation were used in presenting and analyzing results.

Tabulation and data analysis

Firstly: Determining the spreading level of wheat herbicides and applying its scientific recommendations

- 1- Determining the recommended spreading level of wheat herbicides through 6 paragraphs. The highest numeric value amounted to 16, the lowest value amounted to 6, and they are distributed in three levels (weak, medium, and high) as shown in Table (3).
- 2- Determining the level of applying scientific recommendations to using the recommended wheat herbicides through 4 paragraphs. The highest numeric value amounted to 11, the lowest value amounted to 4, and they are distributed in three levels (weak, medium, and high) as shown in Table (3).
- 3- Determining the spreading level of wheat herbicides and applying its scientific recommendations to using it through 10 paragraphs. The highest numeric value amounted to 27 and the lowest numeric value amounted to 10, they are distributed in three levels (weak, medium, and high) as shown in Table (3).

Table 3: The limits of numeric value for the spreading level of Herbicides and applying their scientific
recommendations.

Торіс	Number of paragraphs	Ranges of Values	Applying Levels
Wheat herbicides	6	6 — 16	Low 9-6 Medium 13- 10 High 16-14
Applying the recommendations of Wheat herbicides	4	4 — 11	Low 6-4 Medium 9-7 High 11-10
Chemical herbicides and applying its scientific recommendations	10	10 — 27	Low 15–10 Medium 21- 16-7 High 27-22

Second: Measuring variables of wheat herbicides and applying its scientific recommendations

1- The spreading level of recommended wheat herbicides

The spreading level of recommended wheat herbicides has been determined by six paragraphs: Using recommended chemical herbicides, Source of chemical herbicides, Quality of chemical herbicides, Area controlled by chemical herbicides, Continuity in using chemical herbicides, Damages of chemical herbicides. It was used two alternatives to the paragraph of using the recommended chemical herbicides are: using herbicides or does not use herbicides, there are many chemical herbicides recommended in controlling wheat weeds used by the competent authorities in the General Authority for the protection of crops belonging to the Ministry of Agriculture through agricultural offices located in local markets, which are with foreign origin. Among the most important ones (D.D. 2.4, Logran, Grandlstar, Lanetor, Derby) are used to controlling broad-

leafed weeds such as (Common Mallow, Milk Thistle, Wild Beet, Wild Radish, Field Lepidium Bindweed, draba. Grass pea, Polygonum Galanthus, aviculare, Fruit bedstraw, Monotropa, chickweed, Atriplex, Medic, Cephalaria, Toothed etc.). The herbicides (Illoxan, Topic) are used to controlling Narrow leafed weeds such as (annual ryegrass, Lolium temulentum, Phalaris minor, Solanum nigrum, Rye weeds, Wild Barley weed, oats weeds, Abu Suef weeds, Bromus tectorum, etc.). The herbicides (Atlantis, Plus, Chevalier) are used to controlling broad and Narrow leafed weeds (27,30). Two alternative paragraphs were used to damage the chemical herbicides which are (there are no damages or there are damages). and three alternatives for each source of herbicides (governmental sector, governmental and private sector, private sector), the quality of chemical herbicides (good, medium, and poor), the area controlled with herbicides (all cultivated area, half of the cultivated area or more, less than half the cultivated area), and Continuity in the use of chemical herbicides (10 years and over, 5-9 years, 1-4 years). The weights were determined (3, 2, 1), respectively for each alternative in the paragraphs as shown in Table (4).

Table 4: The used alternatives for the paragraphs of spreading the recommendations wheat Herbicides
in the respondents' field.

Paragraph name	First alternative	Second alternative	Third alternative
Using Herbicides	Herbicides are used	Herbicides are not used	
Source of Herbicides	Governmental sector	Governmental and private sector	Private sector
Quality of Herbicides	Good	Medium	Poor
Continuity in the use of Herbicides	10 years and over	5-9 years	1-4 years
The area controlled with herbicides	All cultivated area	Half of the cultivated area or more	less than half the cultivated area
Herbicides damage	There are no damages	There are damages	

2- The level of applying scientific recommendations for the use of recommended wheat herbicides

Four paragraphs were identified for the level of applying scientific recommendations for the use of recommended wheat herbicides are the type of herbicides, the quantity of the herbicides, the date of control, and the method of controlling. Two alternatives were used to the controlling method (using a 400L / dunum sprayer that carried behind the tractor, a 100 L/ dunum ground tank was used (use manually), and three alternatives for each of the three paragraphs, which are the type of herbicides (herbicides to controlling broad and narrow-leafed weeds, herbicides to controlling broad-leafed weeds,

herbicides to controlling narrow-leafed weeds), the quantity of the herbicides (according to the scientific recommendation for each herbicide/dunum, more than the scientific recommendation for each herbicide/dunum, less than the scientific recommendation for each herbicide/dunum), the date of controlling (when appearing 3-4 leaves for the herbicides, in the elongation phase for the wheat, before the branching phase for the wheat) (26, 27). The weights were determined (3, 2, 1), respectively for each alternative in the paragraphs as shown in Table (5).

Table 5: The used alternatives for the paragraphs of applying scientific recommendation	s for the use of
recommended wheat herbicides in the respondents' field.	

Paragraph name	First alternative	Second alternative	Third alternative
The type of herbicides	broad and narrow-leafed weeds	Broad leafed weeds	Narrow leafed weeds
The quantity of the herbicides	According to the scientific recommendation for each herbicide/dunum	More than the scientific recommendation for each herbicide/dunum	Less than the scientific recommendation for each herbicide/dunum
The date of controlling	Appearing of 3 – 4 Leave of weeds	In the elongation phase for the wheat	Before the branching phase for the wheat
The method of controlling	A 400L / dunum sprayer that carried behind the tractor	A 100 L/ dunum ground tank was used (use manually)	

3. RESULTS AND DISCUSSION

The first axis: The spreading level of recommended wheat herbicides in the respondents' fields

It appeared that the highest numeric value for the spreading level of recommended wheat herbicides in the respondents' fields amounted to (15 degrees), the lowest value amounted to (13 degrees), and with an overall average amounted to (13.85 degrees), on a scale consisting of 6 paragraphs, the limits of its numerical value ranged from 6 to 16 degrees, and 77.34% of the respondents were the spreading level of recommended wheat herbicides in their fields is described as good, with an average amounted to (14.10 degrees). It exceeds the mean value for the degree of the scale which amounted to (11 degrees), and with a standard deviation amounted to (3.16 degrees). The absence of respondents describes the spreading level of wheat herbicides for them as weak as shown in Table (6).

Categories	Range of values	Average of values	Number	Percentage (%)	Standard deviation
Low	6 — 9	0	0	0	
Medium	10 - 13	13	17	22.66	2 16
High	14 — 16	14.10	58	77.34	5.10
Total	6 — 16	13.85	75	100	

Table 6: The spreading level of recommended wheat herbicides in the respondents' fields

Table(6) shows that the spreading level of recommended wheat herbicides in the respondents' fields is described as good, and this positively affects the productivity, wheat production and economic returns for the respondents. It may be due to reasons including:

1- The large and important role for the private sector represented by the local agricultural offices in the process of supplying wheat herbicides for farmers in terms of quantity, quality and time, and it is one of the good foreign origins that are characterized by high efficiency in controlling herbicides despite the high commercial prices.

2- There is a limited contribution to the government sector in the process of providing farmers with specific types and very few quantities of wheat herbicides during the growing seasons at subsidized or distributed prices for free, and it generally does not cover the needs of farmers in controlling all areas cultivated with wheat, but it also contributes to the process of spreading herbicides among farmers in very specific proportions.

3- Most farmers have knowledge of long and accumulated field experience in wheat cultivation of the importance of using herbicides in controlling wheat herbicides annually and applying its correct scientific recommendations, which lead to increased productivity, wheat production and economic income for farmers. So they always turn to agricultural offices to get their herbicides needs in order to complete the control process. This means that most farmers do not need the knowledge and sciences that should be taken from the agricultural extension, which is characterized by its general activity. Through the research, it appeared that the total indicative activities in this regard in the division's work area for the three agricultural seasons mentioned above are 3 extension activities with a rate of 1 extension activity/year (28).

The second axis: The level of applying scientific recommendations for the use of recommended wheat herbicides

It appeared that the highest numeric value for the level of applying scientific recommendations for the use of recommended wheat herbicides in the respondents' field amounted to (11 degrees), the lowest value amounted to (9 degrees), and with an overall average amounted to (10.95 degrees), on a scale consist of 4 paragraphs, the limits of its numerical value ranged from 4 to 11 degrees, and 89.34% of the respondents were the level of applying scientific recommendations for the use of recommended wheat herbicides in their fields is described as good, with average of its value amounted to (10.85 degrees). It exceeds the mean value for the degree of the scale which amounted to (7.5 degrees), and with a standard deviation amounted to (2.29 degrees). respondents The absence of

describes the level of applying wheat herbicides for them as weak as shown in Table (7).

Categories	Range of values	Average of values	Number	Percentage (%)	Standard deviation
Low	6 — 4	0	0	0	
Medium	9 — 7	9	8	10.66	2 20
High	11- 10	10.85	67	89.34	2.29
Total	11 - 4	10.95	75	100	

Table 7: The level of applying scientific recommendations for the use of recommended wheat herbicides in the respondents' fields

Table (7) shows that the level of applying scientific recommendations for the use of recommended wheat herbicides in the respondents' fields is described as good. This positively affects the productivity, wheat production and economic returns of the respondents. It may be due to the same reasons that appeared in Table (6).

The third axis: The spreading level of recommended wheat herbicides and applying

respondents for its scientific recommendations in the area of work for the department of Al-Mahawil

It appeared that the highest numeric value for the spreading level of recommended wheat herbicides and applying respondents for its scientific recommendations in the respondents' field amounted to (26 degrees), the lowest value amounted to (22 degrees), and with an overall average amounted to (24.50 degrees), on a scale consisting of 10 paragraphs, the limits of its numerical value ranged from 10 to 27 degrees, and 100% of the respondents were the spreading level of recommended wheat herbicides and applying respondents for its scientific recommendations in their fields is described as good, with average of its value amounted to (24.50 degrees). It exceeds the mean value for the degree of the scale which amounted to (18.5 degrees), and with a standard deviation amounted to (5.18 degrees). The absence of respondents describes the spreading level of recommended wheat herbicides and applying respondents for its scientific recommendations for them as weak or medium as shown in Table (7).

Table 8: The spreading level of recommended wheat herbicides and applying respondents for its
scientific recommendations in the respondents' fields

Categories	Range of values	Average of values	Number	Percentage (%)	Standard deviation
Low	15 - 10	0	0	0	
Medium	21-16	0	0	0	5 19
High	27-22	24.50	75	100	5.18
Total	27-10	24.50	75	100	

Table (8) shows that the spreading level of recommended wheat herbicides and applying respondents for its scientific recommendations in the respondents' fields are described as good. This positively affects the productivity, wheat production and economic returns of the respondents. It may be due to the same reasons that appeared in Table (6).

4. CONCLUSIONS

- 1- The large and important role for the private sector represented by the local agricultural offices in the process of supplying wheat herbicides for farmers in terms of quantity, quality and time, Which contributed effectively in the process spreading chemical of herbicides farmers. among and positively affecting the increase in productivity, wheat production and economic income of the department's farmers.
- 2- The use and applying scientific recommendations for good herbicides by wheat farmers is a major reason for increasing the productivity of wheat crops in the department's work area.
- 3- Most farmers of the Department of agriculture in Al-Mahawil and as a result of accumulated experience in wheat cultivation, have knowledge about the importance of using

herbicides to controlling wheat herbicides annually and applying its correct scientific recommendations, which lead to increased productivity, wheat production and economic income for farmers.

4- Weak role of extension activity in the Department's work area and Babylon province regarding extension activities directed to farmers related to applying correct scientific recommendations for the use of wheat herbicides because of poor extension plans and plans for disseminating modern technologies.

5. RECOMMENDATIONS

- 1- Developing an appropriate strategy to ensure the participation of the private sector with the government sector in the process of supplying chemical herbicides, including wheat herbicides for wheat, for farmers, in terms of quantity, quality and time, through the Agricultural Supplies Company and its centers of sectors, to ensure the spread of chemical herbicides between farmers, increasing productivity, wheat production. farmers 'income and income of the national economist.
- 2- Activating the role of agricultural extension in the agricultural departments through providing guidance plans and programs for disseminating

technologies, applying their scientific recommendations and intensifying extension activities in the light of the needs and problems experienced by farmers in the field, which is an important factor that contributes to the good use of agricultural technologies and applying their correct scientific recommendations.

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