



Evaluation of herbicide in growth and yield of bread wheat (*Triticum aestivum* L.) and associated weeds

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* Date of research received 28/03/2023 and accepted 04/05/2023.

Abstract

This study was conducted for the aim of evaluating the performance of three types of selectivity herbicide to control weeds in the fields of soft wheat (bread wheat). A variety in the agricultural season 2020 - 2021 in two locations, the first site in Bashiqa district north of the city of Mosul on the rain line and the second site in the research station of the field crop department At the Faculty of Agriculture and Forestry, University of Mosul, the experiment was carried out Randomized Complete Design .The Results show two study sites recorded the highest average dry weight trait of the weed (82.28, 55.69) gm⁻² and (18.33, 18.67) plants .m⁻² sequentially, and differed effect from most herbicide coefficients at both sites. While the treatment of Lancelot and Claudia herbicide when applied the recommended concentration and recorded the lowest average dry weight of the weed and number at both study sites. All herbicide coefficients superiority significant the comparative treatment in the adjective (plant height, number of spikes, spike length, weight of 1000 grains, and grain harvest) in the first location and excelled in the adjective (plant height, number of grains in spike, and spike length) at the second location. Lancelot and Claudia's treatment outperformed the rest of the studies in the grain quotient status and scored the highest average of (285.0, 277.5) gm⁻² respectively at first position (349.26, 324.75) gm⁻² respectively in the second position.

Key words: herbicides, weeds, bread wheat, Lancelot

Citation: Abdulateef, M., Almashhadany, A., Mohammad, N., & Alobaidi, S. (2023). Evaluation of herbicide in growth and yield of bread wheat (*Triticum aestivum* L.) and associated weeds. *Kirkuk University Journal For Agricultural Sciences*, 14(2), 74-82. doi: 10.58928/ku23.14207

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Introduction

The wheat is (*Triticum spp.*) generally and the bread wheat (*Triticum aestivum* L.) In particular, it is considered the main and strategic food source, and the most important among the grain field crops in Iraq, especially in the world, which belong to the grass family panacea, as it ranks first among other cereal crops. Not only that, but it is considered the most important source of carbohydrates obtained by man, which is what man has been known since ancient 2% fat is another food mater [1] . According to the latest statistics according to the Central Statistical Organization of the Iraqi Ministry of Planning for 2021, wheat production in Iraq reached 4 million and 438 thousand tons, The spread of weeds that cause a decline in yield and quality, especially annual weeds, that are similar in growth to the wheat crop because of the lack of action to weeds control in wheat fields, especially in the conditions of or through the accumulation of disease covd19 on them. Because it is not possible to conduct different methods to weed control in wheat fields because of the method of growing the crop and its sensitivity, the chemical method using precautionary herbicides is the best, most appropriate and least harmful option to the crop. This was confirmed by researchers in the field of bush control in the fields of soft wheat (bread wheat), that the use of herbicides [2] [5] [6] The aim of the study is to test the efficiency of some

herbicides in the market with a modern herbicide introduced and obtain the best effectiveness in eliminating weeds in the fields of bread wheat in Nineveh Governorate.

Materials and methods

This study was conducted for the purpose of evaluating the performance of three types of optional herbicide to control weeds in the fields of soft wheat (bread wheat). A variety of Behoth in the agricultural season 2020 - 2021 in two locations, the first site in Bashiqa district north of the city of Mosul on the rain line and the second site in the research station of the field crop department at the Faculty of Agriculture and Forestry, University of Mosul, the experiment was carried out Randomized Complete Design. Three types of herbicide were used, two of which are currently used in the fight against the weed and the other modern ones, namely the Repeller Claudia and Asyad, and the other is a Lancelot insecticide in two concentrations per herbicide (recommended and less than recommended) with your comparative treatment without a herbicide. The cultivation was carried out on 21/12/2020 in two locations, and the application of Applied herbicide spraying was carried out on 3/3/2021. The samples were taken one month after the date of the chemical control. it was samples collecting after one month the date of control and the characteristics of growth were taken when the flowering was completed at harvest on the date of 3/6/2021 of the following qualities: the total numbers weeds per m², the dry weight of the total weeds per m², the

height of the plant, the number of spike², the number of grains in spike, the length of the spike, the weight of 1000 grain, grain yield per m², The data was analyzed using the Gene State program and the medium was tested using testing LSD and Randomized Complete Design of the entire random sectors.

Results and discussion

When diagnosing and counting diffuse weed species on the study sites, most of the diffuse weeds were narrow leaf weed and were prevalent on broad-leaved weed due to low rainfall rates in the 2020-2021 planting season.

Dry weight of weeds (g. m⁻²)

The data in tables (1, 2) indicate that differences between the treatment in the dry weight trait of the weed. The comparison transaction recorded the highest average of this trait in both study sites (82.28, 55.69) g. m⁻² It differed effects at both study sites except for the treatment of the herbicide master when adding half of the recommended concentration at the first site that did not effects and recorded an average of (57.60) g. m⁻². In the first place it significant effect the Lancelot herbicide treatment when the recommended concentration was added and the lowest average of this trait was (25.83) g. m⁻² which did not significant effect from the rest of the chemical herbicide coefficients used in the study except for the treatment of the herbicide master when adding half of the recommended concentration that differed morally from it in this site. In the second place, Claudia's treatment was significant effect when the recommended concentration was added to the rest of the treatment and

the lowest average of this trait was (17.52) grams. m⁻² Excludes the treatment of the herbicide Lancelot when adding the recommended concentration that did not significant effect from it and recorded an average of (25.29) g m⁻² in this location The reason for the low dry weight of the weed when using herbicides is due to its efficiency in inhibiting the formation of enzymes that help in the biosynthesis of acids and thus prevent the formation of new leaves of plants. This leads to the elimination of the weed and its death. This result agreed with [11] [12].

Number of weeds m⁻²

The data in tables (1, 2) indicate that there are significant differences between of the number of the weed and in the two sites of study. The comparison treatment recorded the highest average of this trait at the study sites at (18.33, 18.67) plants. m⁻², differed from the rest of the treatment except for the treatment of the herbicide masters when adding half of the recommended concentration at the first site, which was not morally different and recorded an average of (14.00) plants. m⁻². At the first site of the study, the herbicide Lancelot was recorded when the recommended concentration was added, the minimum average of this trait was (6.17) plants. m⁻² which did not differ morally with most herbicide coefficients used in the study. In the second place, the treatment of the herbicide Claudia was morally outperformed when the recommended concentration was added to the rest of the herbicide coefficients and the lowest average of this trait was (5.67) plants. m⁻² Except for the treatment of the insecticide Lancelot when adding the

recommended concentration that did not differ morally from it and recorded an average of 8.33 plants. m⁻². On this site the effect of the herbicides Claudia and Lancelot was evident when added to the recommended concentration. Is due to the efficiency of these herbicides in inhibiting the work of some enzymes specialized in the biosynthesis of amino acids inside weed plants and thus prevents these plants from forming amino acids, which leads to yellowing and dying of their leaves, eliminating weed plants and decreasing their numbers per unit area. This is what many researchers [5] [6] who have confirmed a decrease in the number of weeds when using chemical herbicides.

Plant height (cm)

The results of the statistical analysis contained in tables (1, 2) showed that all herbicide coefficients used in the study outweigh the comparative treatment in the plant elevation trait and at the study sites, where the comparative treatment recorded the lowest average of this trait (39.23, 37.67) cm for the two sites, respectively. At the first site of the study, the treatment of the herbicide Claudia excelled when adding the recommended concentration and recorded the highest average of this trait at (55.13) cm. Lancelot was morally superior when adding the recommended concentration and recorded the highest average of this trait (60.53) cm, except for the treatment of Claudia when adding the recommended concentration, which did not differ morally from it and recorded an average of (57.33) cm in this site. The reason for the superiority of herbicide coefficients over the comparison treatment in the status of plant

height is due to the effectiveness and efficiency of these herbicides, reducing and inhibiting the dry weight of the weed, reducing its number, and providing a suitable environment for the growth of crop plants without competition with the growth requirements such as light, water and nutrients, thus increasing the efficiency and activity of The activity of photosynthesis and other vital events, such as the elongation of stem internode , which contribute to increasing the height of the plant, and this result was in line with what happened to it [2] [12] [14] who confirmed that the use of herbicides in the fight against the weed contributes significantly to increased height of plant .

Number of spikem⁻²

The data in tables (1, 2) indicate that there are moral differences between the treatment in the attribute of the number of spikes at the study sites. All treatment outperformed the comparative transaction, which scored the lowest average of this quality (164.00, 177.00) spice. m⁻² Except for the treatment of the herbicide masters when adding the recommended concentration in the second site, from the comparative treatment and recorded an average of (202.67) Spices. m⁻², the treatment of the Lancelot herbicide outperformed when the recommended focus was added to the rest of the treatment and the highest average of this trait was (285.7) spice. m⁻² at the first location. In the second place, the treatment of the herbicide Lancelot was also superior to the addition of the recommended concentration and recorded the highest average of this trait at (295.33) Spices. m⁻² . The treatment of Claudia and masters was not effect

significant when described by recommended concentration, which recorded an average of (275.33, 255.33) Spike. m^{-2} The reason is due to the effectiveness of these herbicides and their efficiency in reducing the number of thin and broad-leaved weeds, inhibiting its dry weights and giving the opportunity for crop plants to grow without competition for growth factors such as water, light and nutrients, thus increasing the efficiency of photosynthesis and its products, which increase the growth and formation of spike This result agreed with what happened to him [7] [15] , who stressed the decrease in the number of weed as a result of the use of chemical herbicides and the opportunity for crop plants to grow in more favorable conditions and thus form effective combs that carry the spices and increase their numbers.

Number of grains in the spike

Tables (1, 2) explained that there are moral differences between the treatment in the status of the number of grains in the Spike and at the sites of the study. All herbicide coefficients used in the study were effect significant the comparison treatment, which scored the lowest average of this trait (30.00, 30.67) grains. Spike for the two sites respectively except for the treatment of Asyad when adding half of the recommended concentration in the first site that did not differ morally from the comparison treatment and recorded an average of (32.67) grains. spike, The best treatment the Lancelot and Claudia herbicide treatment when the recommended concentration was added and with all treatment and at both study sites and recorded the highest average of this

adjective (41.00, 40.00) grain. Herbicides give the crop plants the opportunity to consume and exploit growth factors such lighting, nutrients and even the place. This is reflected positively in the formation of grains and the increase in their number in Spice. Several studies have confirmed that the use of chemical herbicides in the control reduces weed competition for crop plants and increases the number of grains in Spike [5] [8] [13] .

Spike length (cm)

The results of the statistical analysis in tables (1, 2) indicated the moral effect of the chemical herbicides used in the study in the Spike length adjective and at the study sites, as all herbicide coefficients morally outperformed the comparative treatment, which recorded a minimum average of this trait on the study sites of (6.367, 5.73) cm respectively. These treatments topped the first location the Claudia herbicide treatment when adding the recommended concentration, which recorded the highest average of this trait of (8.633) cm, with a significant difference from the rest of the treatment, except for the treatment of the herbicide masters when adding the recommended concentration, which did not differ morally and recorded an average of (8.033) cm. On the second site of the study, the treatment of the herbicide Lancelot excelled at the addition of the recommended concentration and recorded the highest average of this adjective of (18.13) cm and did not differ morally from most herbicide coefficients at this site. It is noted on this site that the three herbicides used in the experiment showed their efficiency, especially when added to the recommended

focus in combating the weed and reducing their impact by reducing their preparation and inhibiting their dry weights, which allowed crop plants to exploit growth factors, increase the efficiency of the photosynthesis process, increase the manufactured materials and transport them to the spice. This is reflected positively in increasing the length of the spice. This finding was consistent with the findings of several researchers [4] [9] [12] who confirmed that the use of herbicides in fighting the weed led to an increase in the length of the Spice.

Weight 1000 grains (g)

The results in Tables (1, 2) indicate the positive effect of herbicides on the weight of 1000 grains and at both study sites. The herbicide coefficients used in the study outperformed the comparative treatment, which recorded a minimum average of this trait at the two sites (23.20, 23.73) grams, respectively, excluding the treatment of the herbicide masters when adding half of the recommended concentration, which did not differ morally from the comparative treatment at the first site of the study and recorded an average swallowing (24.93) g. The treatment of the herbicide Lancelot excelled and recorded the highest average trait at both study sites at (26.63, 30.50) grams, respectively, and did not differ morally with most of the other herbicide coefficients used in the study at both sites. The reason for the increase in the weight of grains when using herbicides is due to their efficiency in reducing the growth of the weed, reducing their number and inhibiting their dry weights, thus giving the opportunity for the crop plants to grow

without competition for the main growth factors such as light, water and nutrients. This leads to an increase in the efficiency of the photosynthesis process, This result was in line with what happened to him [2] [10]. Who stressed that the use of chemical herbicides has created more favorable conditions for the growth of crop plants, increased the staple of processed dry materials and increased grain weight.

Grain yield m^{-2}

The results of the statistical analysis in tables (1, 2) indicated the positive effect of the herbicides used in the study on the grain trait and led to an increase in the cereal compared to the treatment that was not sprayed with herbicides, as the comparative treatment recorded the lowest average of this trait at the study sites of (131.4, 119.38) $g. m^{-2}$, respectively, differed morally from the rest of the treatment except for the treatment of the herbicide masters when adding half of the recommended concentration in the second site, which did not differ morally in this capacity and recorded an average of (179.03) $g. m^{-2}$. Lancelot treatment outperformed when the recommended concentration was added at the study sites and recorded the highest average of this trait (285.0, 349.26) $g m^{-2}$ at the two sites respectively which did not differ morally from the treatment of the Claudia herbicide when adding the recommended concentration at both sites and recorded an average of (277.5, 324.75) $g. m^{-2}$ This was reflected positively in Characteristics and components of the quotient such as the number of spices, the number of grains in Spike and the weight of 1000 grains, thus increasing the grain harvest. This result was

in line with the findings of [1] [12], who confirmed the increase in the grain yield as a

result of the use of chemical herbicides in the weeds control.

Table (1) Effect of herbicide on weeds and growth and yield of Wheat for L 1

Treatment	Dry W. of weed .gm.m ⁻²	No. weeds m-2	Height of plant	No. spike	No. seed of spike	Length of spike	W. 1000 grain	G y gm. m-2
Lancelot 1	25.83	6.17	50.87	285.7	41.00	7.833	26.63	285.0
Lancelot 0.5	35.92	7.33	49.43	201.0	34.67	7.867	26.60	204.8
Claudia 1	43.12	8.00	55.13	237.3	40.00	8.633	26.43	277.5
Claudia 0.5	50.73	9.83	51.63	226.7	33.67	7.700	26.13	206.5
Asyad 1	46.75	11.17	52.50	221.3	37.33	8.033	25.93	191.2
Asyad 0.5	57.60	14.00	47.10	198.7	32.67	7.733	24.93	167.2
Control	82.28	18.33	39.23	164.0	30.00	6.367	23.20	131.4
L.S.D	25.84	5.57	7.022	25.61	4.375	0.754	2.601	30.07

Table (2) Effect of herbicide on weeds and growth and yield of Wheat for L 2

Treatment	Dry W. of weed .gm.m ⁻²	No. weeds m-2	Height of plant	No. spike	No. seed of spike	Length of spike	W. 1000 grains	G y gm. m-2
Lancelot 1	25.29	8.33	60.53	295.33	49.67	8.13	30.50	349.26
Lancelot 0.5	36.66	11.50	54.13	232.00	40.33	7.87	28.17	259.38
Claudia 1	17.52	5.67	57.33	275.33	48.00	8.10	29.68	324.75
Claudia 0.5	28.53	9.50	54.40	227.67	41.00	7.57	27.42	247.45
Asyad 1	39.61	12.67	51.60	255.33	38.67	7.73	29.30	234.63
Asyad 0.5	42.37	13.50	49.48	202.67	37.33	6.97	26.73	179.03
Control	55.69	18.67	37.67	177.00	30.67	5.73	23.73	119.38
L.S.D	10.11	3.726	5.103	45.85	6.451	0.744	2.715	62.33

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تقييم مبيدات مكافحة نمو وحاصل الحنطة الناعمة (*Triticum aestivum* L.) والادغال المرافقة

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المستخلص

تم اجراء هذه الدراسة بغية تقييم اداء ثلاث مبيد مكافحة الادغال الاختيارية لمكافحة الادغال في حقول حنطة الخبز في الموسم الزراعي 2020 - 2021 في موقعين الاول في النواحي الشمالية لمدينة الموصل في ناحية بعشيقية والثاني في محطة قسم المحاصيل الحقلية للابحاث في جامعة الموصل كلية الزراعة والغابات ، نفذت التجربة وفق تصميم القطاعات العشوائية الكاملة RCBD ، وكانت النتائج كما يلي : إذ سجلت معاملة المقارنة في موقعي الدراسة اعلى متوسط لصفة الوزن الجاف للأدغال وعددها بلغ (82.28، 55.69) غم. م² و(18.33، 18.67) نبات.م² بالتتابع، واختلفت معنوياً عن معظم معاملات المبيدات في كلا الموقعين. في حين تفوقت معاملة المبيدات لانسلوت وكلوديا عند إضافة التركيز الكامل وسجلت أدنى متوسط للوزن الجاف للأدغال وعددها في كلا موقعي الدراسة. وتفوقت جميع معاملات المبيدات معنوياً على معاملة المقارنة في صفة (ارتفاع النبات، عدد السنابل، طول السنبل، وزن 1000 حبة، وحاصل الحبوب) في الموقع الأول وتفوقت في صفة (ارتفاع النبات، وعدد الحبوب بالسنبل، وطول السنبل) في الموقع الثاني. وتفوقت معنوياً معاملة المبيد لانسلوت وكلوديا على بقية المعاملات الداخلة في الدراسة في صفة حاصل الحبوب وسجلت اعلى متوسط للحاصل بلغ (285.0، 277.5) غم.م² على التوالي في الموقع الأول و(349.26، 324.75) غم.م² على التوالي في الموقع الثاني.

الكلمات المفتاحية: مبيدات ، ادغال ، حنطة الخبز ، لانسلوت