

## Effect of Some Chemical Herbicides on the Weeds Accompanying the Field's Peanut Crop

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### ABSTRACT

A field experiment was conducted during the spring season of 2021 in a selected field of preparative Ibn Al-Bitar occupational/ Al-Hussainiya region in Holy Karbala. The experiment involved cultivating peanut plants (*Arachis hypogaea* L.), specifically a local variety, in soil characterized by a clay loam texture. The experiment aimed to determine the most effective chemical herbicides for controlling weed growth in conjunction with the Peanut crop. The experiment utilized a randomized complete block design (RCBD) with three replications. The study encompassed six conditions: weedy and weed-free, which were under manual control for the entire duration of the growing season. Furthermore, there were treatments that involved the administration of chemical herbicides before planting, specifically Trifluralin and Pendimethalin, which were applied ten days before the planting phase.

Additionally, post-planting herbicides, namely Oxyfluorfen and Clethodim, were sprayed during the vegetative growth phase of the plant as well as at the initiation of the flowering stage. The herbicides were administered according to the prescribed dosages. The findings demonstrated significant differences in the management procedure utilizing chemical herbicides throughout a 30-day period of applying said herbicides. This discrepancy became apparent when evaluating the two herbicides, specifically Oxyfluorfen and Pendimethalin, which produced the lowest quantity of broad-leaf weeds, with a recorded density of 4.6 and 7.6 plants m<sup>-2</sup>, respectively.

Additionally, the results demonstrated that notable disparities were observed after 60 days from the application of herbicides. Specifically, the herbicides Pendimethalin and Oxyfluorfen exhibited the lowest density of broad-leaf weeds, with a count of 4.6 and 6.0 m<sup>-2</sup> plants, respectively. Moreover, the impact of herbicides on narrow-leaf weed was examined at 30 and 60 days post-spraying. There was no significant difference in the means of the herbicides, and the herbicides Oxyfluorfen and Pendimethalin yielded the least density of broad leaf weeds after 90 days of herbicide application, with quantities of 6.0 and 6.3 plant m<sup>-2</sup>, respectively. Similarly, concerning narrow-leaf weed density on the same date, the herbicides Trifluralin, Clethodim, and Ox-yfluorfen exhibited superiority in achieving the lowest density of narrow-leaf weeds, with quantities of 5.0, 5.3, and 5.6 plant m<sup>-2</sup>, respectively.

Furthermore, no statistically significant difference was observed among these herbicides. The findings demonstrate the superiority of the herbicides Oxyfluorfen and Pendimethalin in achieving the highest percentage of control for broad-leaf weeds after 30, 60, and 90 days of herbicide application. Regarding the specific dates for the narrow-leaf weeds, the herbicides Oxyfluorfen, Clethodim, and Trifluralin exhibited superiority in providing optimal control. In contrast to alternative treatments involving herbicides, the herbicide Oxyfluorfen showcased the most diminished mean mass and the utmost level of hindrance on both extensive and limited-leafed weeds.

Keywords: Herbicides; Oxyfluorfen; Pendimethalin; Clethodim; Trifluralin; Weeds; Narrow leaf; Broad leaf.

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## INTRODUCTION

Peanut (*Arachis hypogaea* L.) of substantial economic value in the world, returns to the Leguminosae, which is of high nutritional value, as its seeds contain (45-50)% oil, (27-33)% protein and a primary source of minerals and vitamins<sup>1</sup>, Iraq consumes large quantities of this crop, more than 40 thousand tons annually, to be used in oil extraction, It is hoped that the cultivated area in Iraq of this crop will increase due to the increased demand for it for its multiple industrial benefits<sup>2</sup>, which is limited compared to the countries producing this crop, The production of the field Peanut annually is about 41.9 million tons and contributes 7.3 % of the total oil seed production in the world for the year 2018<sup>3</sup>. Iraq consumes large quantities of this crop, more than 40 thousand tons annually, for oil extraction. It is hoped that the cultivated area of this crop in Iraq will increase due to the increased demand for its multiple industrial benefits<sup>4</sup>. There are many weeds in the field of Peanut in Iraq, Nutgrass (*Cyperus rotundus* L.), Barley grass (*Imperata cylindrical* L.), Wild oats (*Avena fatua* L.), Rough pigweed (*Amaranthus retroflexus* L.), Button weed (*Malva rotundifolia* L.), Smeller Bind Weed (*Convolvulus arvensis* L.), Purslane (*Portulaca oleracea* L.)<sup>5</sup>, Weeds herbicides are considered as an alternative or supplement to combat harmful weeds through manual hoeing, and they are the latest research findings of effective means of tackling these plants, and if these compounds are better used, they give guaranteed results, It is considered one of the most effective means of combating weeds of various types , especially pre-planting herbicides such as Trifluralin, which is a selective, specialized herbicides used to control weeds seeds in soybean, bean and pea fields in the (3-4) leaf stage to control seasonal weeds and broad leaves weeds, it prevents root growth by interrupting cell division<sup>6</sup>, As well as Pendimethalin, which has the same effect as Trifluralin, but it is used before or after planting to control narrow leaves weeds and some broad leaves weeds in cotton, corn and soybean fields. These herbicides belong to the Dinitroaniline group<sup>7</sup>. Oxyfluorfen belongs to the Diphenylether group. It is a selective herbicide that inhibits the synthesis of chlorophyll and carotene. It is used by contact or spraying directed at the weeds and not directed at the plant to avoid the effect of the herbicides as much as possible in large areas of uncontrolled lands<sup>8</sup>. Untargeted spraying did not cause any toxicity symptoms on the plant, as it is used before or after germination to control annual weeds in cotton and soybean fields<sup>9</sup>. Clethodim is also used after germination to control narrow-leaf weeds in grass and dicotyledons and inhibits the synthesis of fatty acids. In chloroplasts, the herbicides belong to the cyclohexanedione group<sup>10</sup>. Given the importance of the study on weed control and increasing production of peanut plants, this study came to evaluate the efficiency of Trifluralin, Pendimethalin, Oxyfluorfen and Clethodim in controlling the different types of weeds associated with field peanut crops.

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## MATERIALS AND METHODS

A field experiment was conducted in a field located in the preparative Ibn Al-Bitar occupational / Al-Hussainiya region in Holy Karbala for the spring season of 2021. The experiment involved cultivating the Peanut plant (*Arachis hypogaea* L.), a local variety, in soil with a clay loam texture. The experiment followed a randomized complete block design (RCBD) with three replications. The field's soil was prepared for cultivation through plowing, smoothing and leveling. It was divided into three replicates, the distance between each two replicates (1.5) m. Each replicate contains 18 experimental units, with an area of 3 x 3 m<sup>2</sup>; one experimental unit represents an area of 9 m<sup>2</sup>, the unit includes three lanes, and the seeds of field peanuts of the local variety, were planted in the spring season on 12/4/2021 on lines, as the distance between line. Another was 75cm, and between one seed and another was (30)cm, the planting was done on one side of the line and by three lines to obtain a plant density of (44440) plants ha<sup>-1</sup>, and 2-3 seeds were placed in each hole at a depth of 5-3 cm<sup>11</sup>, The thinning process was carried out after the plant reached a height of 20-25cm and the incubation process was carried out, i.e. collecting the soil around the plant so that the spurs emerging in the period after flowering time could penetrate the soil and ensure the preservation of soil moisture and increase the yield<sup>12</sup>.

The experimental design comprised of six different treatments, namely weedy and weed-free. These treatments were meticulously controlled by manual intervention throughout the entire growth season.

Additionally, there were treatments involving the application of chemical herbicides, Trifluralin 48% EC and Pendimethalin 33% EC, which were sprayed onto the crops ten days before planting. Furthermore, after planting herbicides, Oxyfluorfen 24% EC and Clethodim 120 gL<sup>-1</sup>, were also sprayed during the vegetative growth and initial flowering stages. It is worth noting that all sprayed herbicides were used at the recommended rates and were registered following the guidelines set by the Ministry of Agriculture in Iraq<sup>13</sup>.

A 16-liter dorsal sprayer was used and a diffuser such as bubblegum was added in an amount of 0.16 ml L<sup>-1</sup> to break the superficial tension layer of the plant leaves because there is a waxy layer covering the stomata. Mineral fertilizers were added to the experiment according to the fertilizer recommendation: 100 Kg N ha<sup>-1</sup>, 80 Kg P ha<sup>-1</sup> and 150 Kg K ha<sup>-1</sup>, as urea fertilizer (46% N), mono superphosphate fertilizer (P<sub>2</sub>O<sub>5</sub> 20%) and potassium sulfate fertilizer (50% K<sub>2</sub>O) were added. Respectively, as sources of nitrogen, phosphorous and potassium to the soil by feeding method at a depth of 5 cm<sup>14</sup>, the characteristics studied were:

- Types and density of the Weeds (plant m<sup>-2</sup>).

The types of weeds were diagnosed, and their density was calculated on the dates (30, 60, and 90) of planting by analyzing and calculating the number of weeds in a square meter of the experimental unit. Table 2. shows the types of weeds, narrow and broad leaves, in the practical field.

- Weeds control percentage (%).

It was calculated after (30, 60 and 90) days after Farming<sup>15</sup>. According to the following equation

$$\% \text{ control} = \left( \frac{\text{Weed density in the control treatment} - \text{Weed density in the control treatment}}{\text{Weed density in the control treatment}} \right) \times 100$$

- Weed dry weight (gm m<sup>-2</sup>).

The weed was cut at ground level, placed in perforated bags, and then in the oven at 60 degrees Celsius until the weight was stable<sup>16</sup>.

- The percentage of inhibition in the dry weight of the weed.

The percentage of inhibition was calculated in the dry weight of the weeds for different treatments<sup>15</sup>.

According to the following equation

$$\% \text{Inhibition} = \left( \frac{100 - A}{B} \right) \times 100, \text{ whereas:}$$

A = dry weight of the weeds in the weeds control treatments

B = dry weight of the weeds in the weed's treatment

The data were statistically analyzed, and the arithmetic means were compared according to the least significant difference test (LSD) at the probability level (0.05).

Properties		Values
pH		7.83
EC (1:1)		2.81 ds m <sup>-1</sup>
OM		1.34 g Kg <sup>-1</sup>
N available		30.44 mg Kg <sup>-1</sup>
K available		28.27 mg Kg <sup>-1</sup>
P available		11.2 mg Kg <sup>-1</sup>
Soil separators	Sand	250g Kg <sup>-1</sup>
	Silt	360g Kg <sup>-1</sup>
	Clay	390g Kg <sup>-1</sup>
Texture		Clay loam
Bulk density		1.32 Mg m <sup>-3</sup>

Table 1. Chemical and physical properties of the study soil at a depth of (0-30) cm before oat planting.

Trade name	Active substance	Used concentration
Treflan EC	Trifluralin 480 EC	2.4 Liters ha <sup>-1</sup>
Trinity EC	Pendimethalin 33%	2 Liters ha <sup>-1</sup>
Toure EC	Oxyfluorfen 24%	1 Liters ha <sup>-1</sup>
Select Super EC	Clethodim 120g/ L	1 Liters ha <sup>-1</sup>

Table 2. Contains the scientific names of the herbicides, the active substances, and the concentrations used.

English name	The scientific name	weeds type	The family	life cycle
Smeller Bind Weed	<i>Convolvulus arvensis</i> L.	broad leaves	Convolvulacea	perennial
Nutgrass	<i>Cyperus rotundus</i> L.	narrow leaves	Cyperaceae	perennial
Aster	<i>Aster tripolium</i> L.	broad leaves	Compositae	perennial
Cane	<i>Phragmites communis</i>	narrow leaves	Gramineae	perennial
Hoary Cress	<i>Lepidium draba</i> L.	broad leaves	Cruciferae	perennial
Barley grass	<i>Imperata cylindrical</i> L.	narrow leaves	Gramineae	perennial
Bermuda grass	<i>Cynodon dactylon</i> L.	narrow leaves	Gramineae	perennial
Prickly alhagi	<i>Alhagi maurorum</i> Medic L.	broad leaves	Papilionaceae	perennial
Rough pigweed	<i>Amaranthus retroflexus</i> L.	broad leaves	Amaranthaceae	Annual
Wild oats	<i>Avena fatua</i> L.	narrow leaves	Gramineae	Annual
Wild radish	<i>Raphanus raphanistrum</i> L.	broad leaves	Cruciferae	Annual
Dodder	<i>Cuscuta campestris</i> L.	broad leaves	Cuscutaceae	Annual
Wild safflower	<i>Carthamus oxyacanthus</i>	broad leaves	Compositae	Annual
Burweed	<i>Xanthium strumarium</i> L.	broad leaves	Compositae	Annual
Scarlet pimpernel	<i>Anagallis arvensis</i> L.	broad leaves	Primulaceae	Annual

<b>Tatarian orache</b>	<i>Atriplex tataricum</i> L.	broad leaves	Chenopodiaceae	Annual
<b>Suwad</b>	<i>Schaginia aegytiaca</i>	broad leaves	Chenopodiaceae	Annual
<b>Wild beets</b>	<i>Beta vulgaris</i> L.	broad leaves	Chenopodiaceae	Annual
<b>Alkali weed</b>	<i>Cressa ceretica</i> L.	broad leaves	Convolvulaceae	Annual
<b>Sweet clover</b>	<i>Melilotus indicus</i> L.	broad leaves	Leguminosae	Annual
<b>Button weed</b>	<i>Malva rotundifolia</i> L.	broad leaves	Malvaceae	Annual
<b>Knotgrass</b>	<i>Polygonum aviculare</i> L.	broad leaves	Polygonaceae	Annual
<b>Purslane</b>	<i>Portulaca oleracea</i> L.	broad leaves	Portulacaceae	Annual

**Table 3.** Types of broad and narrow leaf weeds in the experimental field.

## RESULTS

### Effect of weed control on weed density (plant m<sup>-2</sup>) associated with field peanut crop.

The field peanut crop accompanies many species of annual, transforming, and perennial weeds due to the long growth period and the suitability of its environmental conditions to the winter and summer weeds. Types of weeds in comparative treatments Weedy in which the weeds were left to compete with the crop throughout the growing season. The results indicated in Table 4 that weed control significantly affected the total densities of broad and narrow leaf weeds for the (30) day of spraying the herbicides. The treatment with the herbicide used after planting Oxyfluorfen gave the lowest density of the total weed amounted to (7.9) plants m<sup>-2</sup>, which was significantly superior in reducing the densities of the weed compared to the weedy treatment, which amounted to (34.2) plant m<sup>-2</sup> as well as the herbicide treatments that did not have a significant difference between them Trifluralin, Pendimethalin and Clethodim, which amounted to 14.9, 15.6 and 13.3 plant m<sup>-2</sup> respectively. The results also showed significant differences in the chemical herbicide control process for the same date concerning broad leaf weed compared to the weedy treatment, which amounted to (25.5) plants m<sup>-2</sup> for all herbicides used before and after planting. m<sup>-2</sup> was followed by the herbicide Pendimethalin, which reached (7.6) plants m<sup>-2</sup>, which did not have a significant difference between them.

In contrast, Trifluralin and Clethodim herbicides demonstrated a notable disparity in their impact, as evidenced by the higher density of weeds observed, precisely 10.3 and 10.0 plants m<sup>-2</sup>, respectively. Conversely, when examining the narrow-leaf weeds for the same period, there was no discernible distinction between the mean values of the herbicides. The herbicides Oxyfluorfen and Clethodim produced the least weed density, with 3.3 and 3.3 plants m<sup>-2</sup>, respectively.

The results showed in the same table that for the 60 days of spraying the herbicides, weed control significantly affected the total density of broad and narrow leaf weeds. Significantly in reducing the weed densities compared to the weedy treatment, which amounted to 34.2 plants m<sup>-2</sup> and did not differ significantly from the herbicide treatments Trifluralin, Pendimethalin and Clethodim, which amounted to 14.3, 13.2 and 16.0 plants m<sup>-2</sup> respectively, the results also showed that there were significant differences in the chemical herbicide control process for the same date concerning broad leaf weed compared to the weedy treatment, which amounted to 25.5 plants m<sup>-2</sup> for all herbicides used before and after planting, where the herbicide Pendimethalin, gave the lowest density of broad weed amounted to 4.6 plants m<sup>-2</sup> was followed by the herbicide Oxyfluorfen, which reached 6.0 plants m<sup>-2</sup>, The results showed in the same table for the 90 day date of spraying the herbicides that there was a significant effect of weed control in the total densities of broad and narrow leaf weeds. The weed densities were reduced compared to the weedy treatment, which amounted to 34.2 plants m<sup>-2</sup> and the Clethodim treatment, which amounted to 18.9 plants m<sup>-2</sup>. However, it did not differ significantly from the treatment of the herbicides Trifluralin and Pendimethalin, which amounted to 15.6 and 17.3 plants m<sup>-2</sup> on the results also showed significant differences in the control process with chemical herbicides for broad leaf weeds



for the same date compared to the weedy treatment, which amounted to 25.5 plants m<sup>-2</sup>. It reached (6.3) plants m<sup>-2</sup>, which had no significant difference, while the two agents responsible for the eradication of pests, Trifluralin and Clethodim, exhibited a greater concentration of plants per square meter for broad leaf weeds, specifically 10.6 and 13.6 plants, respectively. In regards to narrow leaf weeds during the same time frame, all of the herbicides, including Trifluralin Pendimethalin, Clethodim, and Oxyfluorfen, demonstrated a higher level of efficacy in reducing the number of narrow leaf weeds to the lowest possible density, specifically 5.0, 11.0, 5.3, and 5.6 plants m<sup>-2</sup>, respectively compared to the weedy treatment which gave, (8.7) plants m<sup>-2</sup>, and none of these herbicides moral difference.

Weed Control	Number of weeds per square meter after spraying (plant m <sup>-2</sup> )								
	30 Days			60 Days			90 Days		
	Broad leaves	Narrow leaves	Total	Broad leaves	Narrow leaves	Total	Broad leaves	Narrow leaves	Total
Weedy	25.5	8.7	34.2	25.5	8.7	34.2	25.5	8.7	34.2
Weed - Free	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trifluralin	10.3	4.6	14.9	10.3	4.0	14.3	10.6	5.0	15.6
Pendimethalin	7.6	8.0	15.6	4.6	8.6	13.2	6.3	11.0	17.3
Oxyfluorfen	4.6	3.3	7.9	6.0	4.0	10.0	6.0	5.6	11.6
Clethodim	10	3.3	13.3	11.0	5.0	16.0	13.6	5.3	18.9
LSD 0.05	5.53	N.S	5.02	7.44	N.S	6.89	5.53	6.12	6.99

**Table 4.** Effect of Weed Control on weed densities m<sup>-2</sup> during crop growth stages (30,60 and 90) days of weed control.

### Weeds control percentage (%)

The percentage of weed control depends on the density of weed plants in the weed treatment and the thickness of the weed in the other treatments. The results indicated in Table 5. that the herbicide Oxyfluorfen achieved the highest control percentage of the total densities of broad and narrow leaf weeds, which amounted to (70.1) %. It did not differ significantly from the average herbicides, Trifluralin, Pendimethalin and Clethodim, which amounted to (54, 51.5 and 61.1) % for the (30) day date of spraying the herbicides. The results also showed significant differences in the percentage of weed control for the same date concerning broad-leaf weed. All the herbicides used before and after planting were significantly superior to the weedy treatment, which amounted to (0.0) %, and Oxyfluorfen gave the highest percentage. The percentage of broad leaf weed control was (78.6%), followed by the herbicide Pendimethalin, which reached (69.8%) and there was no significant difference between them.

In contrast, the two herbicides, Clethodim and Trifluralin, gave the lowest *Weed control percentage* on broad-leaf weed (60.7 and 59.4). As for the narrow leaf weeds of the same date, the two herbicides, Oxyfluorfen and Clethodim, outperformed in giving the highest *Weed control percentage* for the narrow leaf weed, which amounted to (61.6 and 61.6) percent, respectively, followed by the herbicide Trifluralin, which gave (48.6%) and did not There was a significant difference between these herbicides in the percentage of control for narrow leaf weeds. In contrast, the herbicide Pendimethalin recorded the lowest control rate of 33.3% compared to other herbicides. The results showed in Table 5. that the herbicide Oxyfluorfen achieved the highest *Weed control percentage* for the total broad and narrow leaf weeds, which amounted to (65.2) %, and did not differ significantly from the herbicides Trifluralin and Clethodim, which amounted to (56.7 and 49.6) %, respectively, for the 60 days of spraying the herbicides. The results also showed significant differences in the percentage of broad-leaf weed control for the same date. All the herbicides used before and after planting were significantly superior to the weedy treatment, which amounted to (0.0) %, and the two herbicides, Pendimethalin and Oxyfluorfen, were higher. The percentage of controlling broad-leaf weed reached

(81.6 and 76.4%) respectively, and there was no difference between them. At the same time, the two exterminators, Trifluralin and Clethodim, were given (59.4 and 56.8%) respectively. As for the broad-leaf weed for the same date, Trifluralin, Oxyfluorfen and Clethodim were outperformed. In giving the highest percentage of control for narrow leaf weed, it reached (54, 54 and 42.5%) respectively, and there was no significant difference between these herbicides in the percentage of control for narrow leaf weed. As for Pendimethalin, it was recorded. The lowest control rate was (10.3%) compared to other herbicides. The herbicides Trifluralin, Oxyfluorfen and Clethodim significantly increased the percentage of control on thin weed compared with the weedy treatment. The results showed in the same table for the date of (90) days of spraying the herbicides that all the herbicides, Oxyfluorfen, Pendimethalin, Trifluralin and Clethodim, achieved a significant increase in the Weeds control percentage of the total number of broad and narrow leaf weeds amounted to (55.6, 52.6, 49.7 and 42.4) %, respectively, compared to the weedy treatment, which amounted to (0.0) %. The results exhibited noteworthy disparities in the proportion of effective suppression of broad-leaf weeds on a given day. Both Oxyfluorfen and Pendimethalin, the two herbicides, appreciably escalated the degree of suppression for broad-leaf weeds, resulting in approximately 76.4% and 75.1%, respectively. There was no significant difference between them, while the two herbicides, Trifluralin and Clethodim, gave the lowest control percentage on broad leaf weed (56.7 and 46.3%), respectively, compared to other herbicides, as for the narrow leaf weed for the same date, all herbicides outperformed compared to the weedy treatment in giving the highest Weeds control percentage for the narrow leaf weed (42.5, 30.2, 34.8 and 38.6)% for the herbicides Trifluralin, Pendimethalin, Oxyfluorfen and Clethodim respectively.

Weed Control	Weeds control percentage (%)								
	30 Days			60 Days			90 Days		
	Broad leaves	Narrow leaves	Total	Broad leaves	Narrow leaves	Total	Broad leaves	Narrow leaves	Total
Weedy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Weed - Free	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Trifluralin	59.4	48.6	54.0	59.4	54.0	56.7	56.9	42.5	49.7
Pendimethalin	69.8	33.3	51.5	81.6	10.3	45.9	75.1	30.2	52.6
Oxyfluorfen	78.6	61.6	70.1	76.4	54.0	65.2	76.4	34.8	55.6
Clethodim	60.7	61.6	61.1	56.8	42.5	49.6	46.3	38.6	42.4
LSD 0.05	14.29	22.58	18.3	18.20	29.64	17.98	13.60	13.5	13.05

**Table 5.** The effect of weed control on the percentage of weed control ( $m^2$ ) during the crop growth stages for the planting season.

### Dry weight of the weeds ( $gm\ m^{-2}$ )

The study of the dry weight of broad, narrow leaves and total weeds is one of the essential matters, which is added to the density and percentage of weed control to know the efficiency of the herbicides used before and after planting. The results in Table 6 indicated the superiority of the herbicide Oxyfluorfen, which significantly reduced the dry weight of the total number of broad and narrow weeds. The leaves amounted to ( $142.90$ )  $gm\ m^{-2}$  compared to the weedy treatment as well as the herbicide treatments Trifluralin, Pendimethalin and Clethodim, which amounted to ( $1043.3$ ,  $264.90$ ,  $385.60$  and  $242.70$ )  $gm\ m^{-2}$ , respectively. Also, with the herbicide Oxyfluorfen, the average dry weight of broad leaf weeds reached ( $82.30$ )  $g\ m\ m^{-2}$ , which was significantly superior to that of the weedy treatment and the herbicide treatments Trifluralin, Pendimethalin and Clethodim (which recorded ( $547.5$ ,  $264.90$ ,  $385.60$  and  $242.70$ )  $gm\ m^{-2}$  respectively, and the herbicide Oxyfluorfen was significantly superior in recording the lowest average dry weight of narrow leaf weeds

amounting to (60.60) gm m<sup>-2</sup>, It was significantly superior compared to the weedy treatment and Trifluralin, Pendimethalin and Clethodim treatments which recorded (495.8, 88.50, 229.90 and 93.10) gm m<sup>-2</sup>, respectively.

Weed Control	Dry weight of weeds (gm m <sup>-2</sup> )		
	Broad leaves	Narrow leaves	Total
Weedy	547.5	495.8	1043.3
Weed - Free	0.00	0.00	0.00
Trifluralin	176.40	88.50	264.90
Pendimethalin	155.70	229.90	385.60
Oxyfluorfen	82.30	60.60	142.90
Clethodim	149.60	93.10	242.70
LSD 0.05	13.96	15.22	14.53

**Table 6.** The effect of herbicide on the dry weight of the weeds (gm m<sup>-2</sup>).

### Percentage of Inhibition in the dry weight of the Weeds

The study of the percentage of weed inhibition is one of the essential things that is added to the dry weight of broad and narrow-leaf weeds. The results indicated in Table 6. that Oxyfluorfen gave the highest percentage of inhibition in the total dry weight of wide and narrow leaf weeds, which amounted to (86.1%) and thus exceeded significantly compared to the treatments of the herbicides Trifluralin, Pendimethalin and Clethodim, which amounted to (54.0, 51.5 and 61.1)%, respectively. The findings also demonstrated noteworthy dissimilarities in broad-leaf weeds' dry weight inhibition percentage. Oxyfluorfen exhibited superiority by yielding the highest inhibition percentage in the dry weight of broad-leaf weeds, which equated to 88.8%. This superiority was significantly higher than the treatments involving the two herbicides, Pendimethalin and Trifluralin, which amounted to 80.9% and 77.9%, respectively. These values did not differ significantly from the Clethodim treatment, which amounted to 81.5%.

Regarding narrow-leaf weeds, Oxyfluorfen surpassed others by providing the highest inhibition percentage in the dry weight of the narrow-leaf weeds, which amounted to 83.4%. This exceeded the herbicide treatments using Pendimethalin and Clethodim, which amounted to 37.5% and 73.8%, respectively. However, it did not differ significantly from the treatment involving Trifluralin, which amounted to 75.5%. The results indicated that all the herbicides employed significantly increased the inhibition rate for broad and narrow weeds compared to the Weedy treatment.

Weed Control	The percentage of inhibition in the dry weight of the weeds (%)		
	Broad leaves	Narrow leaves	Total
Weedy	0.0	0.0	0.0
Weed - Free	0.0	0.0	0.0
Trifluralin	77.9	75.5	76.7
Pendimethalin	80.9	37.5	59.2
Oxyfluorfen	88.8	83.4	86.1
Clethodim	81.5	73.8	77.6
LSD 0.05	7.44	8.89	6.99



**Table 7. The effect of herbicide on the percentage of inhibition in the dry weight of the weeds.**

## DISCUSSION

The decrease in the density of broad and narrow-leaf weeds is due to the herbicides used in Table 4. Oxyfluorfen used after planting has a non-selective character that works by contact and eliminates all types of annual weeds and perennial broad and narrow leaf weeds<sup>17,18</sup>, while the herbicides used is Clethodim. After planting, it is selective; it eliminates annual and perennial weeds with narrow leaves only<sup>10</sup>, so the types of weeds plants affected by spraying when using Oxyfluorfen herbicides were greater than when using Clethodim, While the herbicides Pendimethalin used before planting is an elective herbicide that eliminates annual and perennial narrow and broad leaves weeds<sup>7,19</sup>. Trifluralin, used before planting, is also an elective herbicide that eliminates weeds, such as weed seeds, during germination. Narrow and broad annual leaves are only<sup>6,20</sup>, so the types of weeds plants affected by spraying when using Pendimethalin were greater than when using Trifluralin. It is noted from the results in Table 5. The superiority of herbicides after planting Oxyfluorfen in achieving the highest rate of control of broad and narrow weeds for the dates of (30, 60 and 90) days of spraying, due to its effect on all types of weeds, followed by herbicides after cultivation, Clethodim, which excelled in giving the highest rate of combating narrow-leaved weeds only. Before planting Trifluralin and Pendimethalin, each of them achieved a varying increase in the rate of controlling broad, narrow, annual and perennial weeds for all dates, and this is due to the specificity of the effect of all herbicides on different types of weeds, especially in annual and perennial weeds for broad and narrow-leaved weeds, and this means that the exterminator after Agriculture Oxyfluorfen was more efficient in controlling most of the weeds in the experimental field<sup>21</sup>. In contrast, the post-cultivation herbicide Clethodim decreased its efficiency in combating the narrow-leaved weeds of annuals and perennials<sup>22</sup>.and the percentage of a discrepancy between the two herbicides is because the herbicides Trifluralin before planting is related to its efficiency through its effect on the seeds of the annual weeds only, which are broad and narrow-leaved. Agriculture Pendimethalin is found in the upper parts of the soil surface, so weed seeds are not affected by the herbicide and can germinate below the area where the herbicide is located<sup>23</sup>.The herbicide showed a different effect between broad and narrow-leaved weeds and annual and perennial weeds, as in Table 6. This may be due to the post-cultivation herbicide Oxyfluorfen, which showed a clear superiority in reducing the dry weight of the weeds due to its control of all types of broad and narrow-leaved weeds, annuals and perennials without exception<sup>24</sup>. While Trifluralin before planting showed a decrease and decrease in the dry weight of the weeds as a result of controlling the broad annual weeds and the narrow leaf weed annual without growing again and without affecting the perennial weeds<sup>25</sup>.and a herbicide works after planting Clethodim, which showed a clear superiority in eliminating the narrow leaved annual weeds, which gave way to the broad leaved annual and perennial weeds to grow in the experimental land and a clear increase in the dry weight of different weeds except for the narrow weeds<sup>26</sup>, while an exterminator was given before planting Pendimethalin increases the dry weight of annual weeds, broad leaved and perennial weeds, due to the fact that the herbicide is on the surface layer of the soil without affecting the seeds of the weeds growing under the surface of the soil and below the area where the herbicide is located, which leads to seed germination and an increase in the number of weeds and thus an increase in weight Dry broad leaved weeds<sup>9</sup>. Increasing the dry weight of broad and narrow-leaved weeds is one of the important matters on which these weeds depend in competition for growth requirements. After planting, Oxyfluorfen works to reduce the efficiency of the photosynthesis process and chlorophyll and carotene dye, causing a defect in the installation of membranes and the disappearance of green color and whiteness of the leaf and the elimination of the number of a large number of weeds leads to a decrease in their dry weight<sup>27</sup>.After planting, Clethodim inhibited the weight of the dry weeds, which is represented in its effect on the biosynthesis of fatty acids in the chloroplasts and the inhibition of cell formation in cellular tissues, which leads to abnormal growth and weakens its ability to compete for the basic requirements for growth<sup>28</sup>.The pre-planting herbicides Trifluralin and Pendimethalin prevent and inhibit the cell division of the growing tops and the vegetative and root systems. The lack of movement of materials represents the photosynthesis process from the source, which is the root of the estuary. Thus, the growth is abnormal, the competition is low, and the dry weight of the weeds is reduced<sup>29,30</sup>.

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## CONCLUSIONS

The importance of controlling with the herbicides used in the experiment, especially spraying with Oxyfluorfen after planting and at the beginning of the flowering phase of the peanut plant to obtain control operations free of annual and perennial weeds of different types without affecting the yield and its components and other characteristics as well as the effect of this herbicide on Reduce weeds densities after planting.

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