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EFFECT OF TREFLAN HERBICIDE AND PHOSPHORUS LEVELSON WEEDS AND CHICK PEA YIELD

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ABSTRACT

A field experiment was conducted in Research Farm of Agriculture College, Duhok University during growing season of 2017 in tow sowing dates (20/2 and 10/3/1917) to investigate four levels of Treflan herbicide (0, 1.200, 2.400, and 3.200) L $ha^{-1,}$) and four phosphorous level ((0, 140, 180 and 220) Kg P_2O_5 ha^{-1}. on growth of weed, yield and yield components of chickpea. Treatments arranged in factorial experiment based on Randomized Complete Block Design (RCBD) with three replications. The results revealed that treflan and phosphorous levels showed considerable reduction on number and dry weight of broad narrow leaved weeds, and significant effect on yield and yield components of chickpea were recorded under interaction (H_3 P_3 D_1) and produced the highest values (1.5, 76.4, 34.3 g, 6.9 g and 58.3cm) for number of seeds pod^{-1}, seeds $plant^{-1}$, 100-grain weight, grain yield plant and height of the lowest pod.

KEYWORDS: Herbicide, weed, chickpea, yield

INTRODUCTION

Chick pea *(Cicer arietinum L.)* is second of the important conventional pulse crop in Kurdistan region Iraq. The chick pea yield is lowest as compared to the highest potential of cultivars. One of the most limiting factors is weed infestation. Chick pea is a low competitor to weeds because of its slow growth rate and restricted leaf area and slow development at the early stages of crop growth and establishment. Auld, .and Lee. (1981). Sawhncy, *et al.* (1985). Tewari, *et al*; (2001) reported that were redacts 80% of chick pea yield when weeds allowed to compete for full season. Several researchers reported that reduction in potential yield losses in chick pea due to weed range between 22% and 100 % (Faroda, and Sing (1981), Sexena (1976) and Yadav, (1988), Bhalla *et al*, (1998). The using of herbicides pre or post-emergence increase with 12%-14 % and 6%-23 %, respectively in a chick pea crop (Ahlawat, *et al.* 1981, Hassan and Khan, (2007). Weed pre emergence with the spring chick pea crop creates a severe competition unless controlled effectively and in a timely manner. Kumar and Sreenivasulu, (2004) reported that the number of pods and seed index was improved under higher phosphorous application. Several researchers reported about phosphorous application in chick pea (Mahajan and Sharma, (2005); Gawai and Pawar, 2007), and found long term fertilizer experiments involving intensive cereal based cropping system which reveal a declining trend in productivity even with the application of recommended levels of N, P, K fertilizers. Shabeer *et al* (2015) found that the application of phosphorous a rate of 55 kg ha^{-1} for maximizing the chick pea yield.

This study was applied to determine the effect of treflan and phosphorus levels on weeds and yield and it components of chickpea.

MATERIAL AND METHODS

The experiment was carried out at the research farm of agriculture College- University of Duhok-Sumail, during spring season 2017, the weather and soil properties are shown in (Table 1). An improved local variety of chick pea was planting in 20/2/2017 and 10/3/2017 in plots 3m x 1.20 m. The Treflan applied pre-planting (before 10 days) in corporate depth of five cm in the soil at 5/2/2017 and 27/2/2017 at 277.5 ml rainfull throw growing season.

The experiment was designed as factorial in Randomize Complete Block Design (RCRD) with

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three replications. The first factor included four dose of treflan herbicide(0,1.2002.400, and 3.600) L ha-1, and the second factor was four doses of phosphorous (0, 140, 180 and 220) Kg P2O5 ha-1. Each experimental unit (plot) comprised four rows with three meter in length, 0.40 cm between rows and 0.50 m between plots. The nitrogen fertilizer was added a rate of 18 Kg ha-1 with planting For all plots. Weed sampling were done at the flowering of chick pea plants.

The studied weeds traits were number and dry weight of broad and narrow leaved weeds. The weeds dry weight were recorded at ($75c^0$) for (48) hr. All data consisted of five plants selected randomly and included plant height, number of primary braches $plant^{-1}$, height of the lowest pod , number of pod $plant^{-1}$, number of seed $palnt^{-1}$,100 seed weight and seed weight $plant^{-1}$. The data analyzed statistically using Minitab software package (16) and Duncan Multiple Range Test (DMRT) at 5% level of probability was applied to compare between means. (Steel and torie, 1984).

Table (1): Forecasting and some physical and chemical properties of top (20-30) cm soil sample of field experiment.

Weather properties					soil properties	
Month	Ave. Daily max.tem c^0	Ave. Daily min..tem c^0	Seasonal Relative Humidity RH %	Seasonal Rainfall mm		
		2016			Sand (gkg^{-1})	89.60
November	12.1	3.6	40.9	10.2	Silt (gkg^{-1})	486.90
December	11.6	2.04	79.4	72	Clay (gkg^{-1})	419.85
		2017			Soil texture	Silty clay
January	12.23	-0.56	73.47	29.1	PH in soil past	8. 25
February	13.76	-57.2	65.8	17.6	Ec (dsm^{-1}) at 25 c^0 in soil past	0.55
March	18.53	6.881	67.05	52.2	CaCo3 ($g\ kg^{-1}$)	205.2
April	24.21	9.52	63.98	81.4	Organic matter k ha^{-1}	145
May	24.4	37.8	19	15.0	Available N k ha^{-1}	0.22
Total				277.5		

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Table (2): list of broad and narrow leaf weeds in experimental site.

Broad leaf weeds		
Common names	*Scientific names*	Family names
Rough cocklebur	*Xanthium strumarium*	Copositae
Milk thistle	*Lactuca serriola L.*	Copositae
Pinkweed	*Polygonum aviculare*	Polygonaceae
Common chicory	*Cichorium intybus*	Asteraceae
Sow thistles	*Sonchus oleraceus*	Asteraceae
Saffron Thistle	*Carthamus lanatus*	Copositae
Centaurea	*Centaurea centaurium*	Asteraceae
Field mustard	*Sinapis arvensis*	Brassicaceae
European heliotrope	*Heliotropium europaeum*	Boraginaceae
Cheeseweed	*Malva parviflora*	Malvaceae
Cephalaria	*Cephalaria syriaca L.*	Caprifoliaceae
Convolvulus	*Convolvulus arvensis L.*	Convolvulaceae
Cowherb	*Vaccaria pyramidata*	Coryophyllaceae
Puncture vine	*Tribulus terrestris i*	Zygophyllaceae
Fat-hen	*Chenopodium album*	Amaranthaceae
Narrow leaf weeds		
Common names	*Scientific names*	Family names
Wild oat	*Avena fatua L.*	Poaceae
Wild barley	*Hordeum spontaneum*	Poaceae
Animated oat	*Avena sterilis L.*	Poaceae
Small canary grass	*Phalaris minor*	Poaceae
Hood canary grass	*Phalaris paradoxa*	Poaceae
Beard grass	*Polypogon monspeliensis*	Poaceae

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RESULTS AND DISCUSSION

The statistical analysis of data in the first and second planting dates showed that.the herbicide levels exhibited significant influence on all of traits.(Table 3). The phosphorous level indicated significant effect on all studied traits except the dry weight of narrow leaved weeds and plant height, while the interaction between herbicides and phosphorous level showed considerably effect on the whole traits with the except of plant height and number of primary branches plant^{-1} in the first planting date. In the second planting date the results in the same table exhibited significant effect for herbicide and phosphorous levels and the interaction between them on all studied traits with the exception of plant height. Similar results were also reported by Holmes and Sprague, (2013). who found that the herbicide suppressed weed growth were more efectively than check treatment.

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Table (3):. Mean square analysis of treflan herbicide and phosphor levels on weeds and chick pea yield in first and second planting date.

		MS											
		First planting time											
S O V	df	No. of broad leaved weeds/m^2	Dry weight of broad leaved weeds g/m^2	No. of narrow leaved weeds/ m^2	dry weight of narrow leaved weeds(g/m^2	plant height (cm)	No. of primary branches $plant^{-1}$	No. of pods $plant^{-1}$	No. of seeds pod^{-1}	No. Seeds $plant^{-1}$)	100 grain weight (g)	Grain weight $plant^{-1}$ (g	Height of the lowest pod
Blocks	2	12.58	6.4*	0.646	168	16.46	0.009	4.15	0.006	7.73	2.436	0.097	7.084
H	3	1611.1**	5948.7**	289.13**	67104**	109.32**	1.85**	1348.7**	0.126**	2405.8**	241.49**	9.0507**	242.4**
P	3	64.24**	350.4**	8.47**	779	14.06	0.4!**	482.55**	0.02**	479.65**	83.403**	4.7218**	34.51**
HxP	9	14.85	46.4**	2.34*	858*	5.01	0.19	137.42**	0.01**	227.3**	20.622**	0.6849**	82.9**
Error	30	7.98	5.6	0.89	374	18.54	0.09	4.82	0.003	6.29	0.776	0.0665	4.152
		Second planting time											
Block	2	0.271	1.15	0.2708	0.8	4.97	0.008	6.18	0.025	3.4	0.565	14.178	8.806
H	3	82.389**	2449.22**	25.91**	490.3**	9.53	1.96**	783.28**	0.140**	1273.2**	194.94**	184.04**	132.02**
P	3	2.5	93.95**	1.298	39.52**	11.73	0.520**	129.21**	0.033**	115.84**	84.635**	86.05**	6.017
HxP	9	3.259**	30.96**	0.873	21.71**	9.83	0.29**	18.41**	0.020**	24.39**	17.45**	7.73	23.497*
Error	30	0.938	7.69	0.4486	2.02	15.33	0.05413	3.84	0.00530	3.53	0a.402	12.82	8.784
Total	47												

***, **,** indicating significant difference at 0. 05 and 0.01 probability level respectively. H – Herbicide, P- Phosphorus levels

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The influence of Treflan herbicide levels on (broad and narrow leaved weeds) was significant at different levels (Table 4). The herbicide at both levels of H3 and H2 were more efficient when controlled broad leaf weeds with 91% and 85%, respectively compared to 31% when use a minimum dose H1. The narrow leaved weeds were controlled with 98% and 92% in the first date planting and second date, respectively. However, the herbicide killed broad leaved weeds with 49%, 73%, and 85% when used at H3, H2 and H1, respectively compared to 41%, 73% and 78% for narrow leaved weeds. The highest weed control efficacy (91%) was resulted by H3 level, fallowed by H2 For narrow leaved weeds the H3 level in the first date whereas in the second date of planting the herbicide gave 49%, 73%, 85% at H3 , H2 and H1, respectively for broad leaved weeds . the results above , the herbicide provided good weed control in first planting date compared with the second date and this may be due to flatfooted and un favourable climates predominant during second date. was not property table one. For the phosphorus levels the P_0 level gave the growth and narrow leaved weed and values were (13.5, 32.1 g/m2, 6.7 and 53.9 g/ m2) in first planting date while, the same level recorded (3.2, 21.9 g /m2, 2.7 and 11.9 g/m2) in the second planting date. For plant height the H_0 level and P_0 level gave the tallest plants with values 55.7, 53.2 cm, respectively in the first planting date while, the tallest plants in the second planting date observed at H_1 and P_2 levels because the hight competition between weeds and chick pea plants. Regarding the yield and yield component of chick pea plant, the data in (Table 4). exhibited that the H_3 level gave the maximum values (3.2, 43.1, 1.4, 56.4, 31.0, 6.0 and 52.0 cm) in the first planting date and the same level recorded (3.1, 32.0, 1.4, 38.5, 30.0, 4.6 and 42.3 cm) in the second planting date. For number of primary branches plant^{-1}, number of pods plant^{-1}, number of seed plant^{-1}, 100 grain weight, grain weight plant and height of the lowest pod. For phosphorus levels, the P_3 gave the maximum values and recorded (2.8, 34.8, 1.3, 45.6, 5.5 and 47.6) in the first planting date and same level phosphorous produced the high values (2.6, 24.3, 1.3, 27.8, 20.7 g, 4.2 g). For number of primary branches plant^{-1}, number of pods plant^{-1}, number of seed pod^{-1}, seeds plant^{-1}, grain weight plant $^{-1}$ in the second planting date. Theses results indicated the best response of chickpea yield and yield components to phosphorus levels as reported by Gebreyeus, (2014).

Table (4): Influence of mean of treflan herbicide and Phosphorus levels on weed and chickpea yield and its components in first and second planting date.

H	No. of broad leaved weeds/m^2	Dry weight of broad leaved weeds g/m^2	No. of narrow leaved weeds/m^2	dry weight of narrow leaved weeds(g/m^2	plant height (cm)	No. of primary branches plant^{-1}	No. of pods plant^{-1}	No. of seeds pod^{-1}	No. Seeds plant^{-1})	100 grain weight (g)	Grain weight plant^{-1} (g	Height of the lowest pod
First date												
H_0	27.3 a	50.8 a	12.8 a	155.6 a	55.7 a	2.4 b	18.3 d	1.2 c	24.3 d	20.9 d	3.9 d	42.8 b
H_1	10.9 b	35.2 b	5.3 b	12.9 b	51.2a b	2.5 b	24.5 c	1.2 b	29.4 c	24.6 c	4.9 c	42.6 b
H_2	3.5 c	7.7 c	3.7 c	3.7 b	52.3 a b	2.3 b	30.9 b	1.2 bc	39.4 b	28.7 b	5.4 b	43.6 b
H_3	1.9 c	4.6 d	1.4 d	2.4 b	48.4 b	3.2 a	43.1 a	1.4 a	56.4 a	31.0 a	6.0 a	52.0 a
P_0	13.5 a	32.1 a	6.7 a	53.9 a	53.2 a	2.4 b	20.7 c	1.2 b	30.7 d	28.6 a	4.2 c	43.6 b
P_1	12.1 ab	24.9 b	5.2 b	45.9 a	52.2 a	2.6 a b	28.1 b	1.2 a b	34.8 c	28.1 a	5.0 b	44.7 b
P_2	8.4 c	21.3 c	4.9 b	39.2 a	50.6 a	2.6 a b	33.1 a	1.3 a	38.2 b	25.7 b	5.5 a	45.1 b
P_3	9.6 b c	20.0 c	6.3 a	35.6 a	51.8 a	2.8 a	34.8 a	1.3 a	45.6 a	22.9 c	5.5 a	47.6 a
Second date												

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H_0	7.0 a	37.8 a	4.5 a	17.8 a	46.7 a	2.3 b	13.8 c	1.2 b c	15.9 c	20.5 d	2.6 d	35.4 b
H_1	2.6 b	19.2 b	2.1 b	10.5 b	47.7 a	2.3 b	16.7 b	1.1 c	19.8 b	22.7 c	3.2 c	37.4 b
H_2	1.9 bc	10.1 c	1.9 b	4.8 c	45.7 a	2.3 b	18.1 b	1.2 b	19.0 b	25.0 b	4.2 b	35.2 b
H_3	1.2 c	5.5 d	1.1 c	3.9 c	46.0 a	3.1 a	32.0 a	1.4 a	38.5 a	30.0 a	4.6 a	42.3 a
P_0	3.2 a	21.9 a	2.7 a	11.9 a	46.4 a	2.2 b	17.0 c	1.1 b	20.7 b	26.7 a	2.5 c	36.7 a
P_1	2.5 a	17.5 b	2.7 a	8.0 b	45.5 a	2.6 a	18.2 c	1.2 a	22.3 b	25.9 b	3.8 b	37.8 a
P_2	3.5 a	18.0 b	2.3 a	8.4 b	47.9 a	2.6 a	21.2 b	1.2 a b	22.4 b	24.9 c	4.1 a	38.3 a
P_3	3.4 a	15.2 b	2.0 a	8.7 b	46.3 a	2.6 a	24.3 a	1.3 a	27.8 a	20.7 d	4.2 a	37.4 a

Means in each column followed by the same letter are not significantly different at the 5% probability level according to Duncan's Multiple Range Test.

Results in the Table (5) condiment that H3 and P3 were superior in all studied traits which gave minimum values for number and dry weight of broad and narrow leaved weeds and recorded values (1.0, 2.5 g, 1.3 and1.2g), respectively compared witcheck treatment for plant height while the same interaction of P3 produced the highest plant with 58.3 cm. The interaction H_3 x P_3 level gave the highest values (3.6, 54.7, 1.5, 76.4, 34.3 g and for number of primary branches plant $^{-1}$, pods plant^{-1}, sees pod^{-1}, seeds plant, 100-grain weight and grain weight plant^{-1}, respectively in the first planting date. In the second planting date also, the H_3 P_3 showed superiority of number and dry weight of broad and narrow leaved weeds and gave minimum values compare with check treatment (H_0 P_0), while, the yield and yield component recorded the maximum values (3.6, 40.0, 46.3, 34.6 g and 5.7 g) for number of primary branches plant^{-1}, pods plant^{-1}. Regarding to height of the lowest pod the H_0 P_0 level gave the highest value (57.4 cm) in the first planting date, while the H_3P_1 recorded the maximum value (45.5 cm). It can be concluded from the above results that the herbicide and phosphorous levels (H_3 P_3) is the most effective to kill weed and increasing yield and yield component. These results are in agreement with those of Muhammad *et al*. (2010).

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Table (5): Influence of treflan herbicide and Phosphorus levels on weed and chickpea yield in first and second planting date.

H	P	No. of broad leaved weeds/m^2	Dry weight of broad leaved weeds g/m^2	No. of narrow leaved weeds/m^2	dry weight of narrow leaved weeds(g/m^2	plant height (cm)	No. of primary branches $plant^{-1}$	No. of pods $plant^{-1}$	No. of seeds pod^{-1}	No. Seeds $plant^{-1}$)	100 grain weight (g)	Grain weight $plant^{-1}$ (g	Height of the lowest pod
First date													
H_0	P_0	27.0 a	63.0 a	14.3 a	196.2 a	40.3 ef	2.2 b	14.7 g	1.2 c	24.4 h	21.3 c	3.7 gh	57.4 a
	P_1	30.3 a	53.9 b	11.7 a	136.4 b	41.8 def	2.3 b	14.6 g	1.2 c	22.6 h	20.4 c	4.0 fgh	55.6 a
	P_2	24.7 a	43.4 c	12.3 a	121.5 b	42.1def	2.4 b	21.3fg	1.1 c	25.0 gh	20.5 c	4.5 e f	54.0 a
	P_3	27.0 a	42.9 c	12.7 a	168.2ab	47. c d	2.6 b	22.5 ef	1.2 c	25.1 g h	21.3 c	3.5 h	55.9 a
H_1	P_0	16.0 b	45.5 c	6.7 b	12.5 c	48.5b c	2.6 b	23.2 ef	1.2 c	28.6 e-h	19.9 c	4.1fgh	51.9 a
	P_1	14.0 bc	34.0 d	3.7 c-f	13.9 c	39.3 e f	2.4 b	25.4 ef	1.2 c	27.5 fgh	25.3 b	4.7 e f	52.1 a
	P_2	6.3 c d	33.2 d	4.3 bcd	14.2 c	38.9 f	2.3 b	24.0 ef	1.3 bc	27.1 fgh	27.0 b	5.1 d e	51.0 a
	P_3	7.3 c d	28.4 d	6.7 b	11.1 c	43.8c-f	2.7a b	25.2 ef	1.2 bc	34.2 def	26.3 b	5.7 c d	50.0 a
H_2	P_0	7.0 cd	13.5 e	4.0 b-e	3.2 c	45.2cde	2.2 b	24.3 ef	1.2 c	37.6 d	25.6 b	4.4 ef	53.3 a
	P_1	2.3 d	6.3 f	4.0 b-e	3.6 c	43.6 c-f	2.3 b	28.3 de	1.2 c	35.7 d e	24.4 b	5.5 c d	54.4 a
	P_2	1.7 d	4.5 f	2.0 c-f	4.8 c	44.5 c-f	2.2 b	34.1 cd	1.2 c	37.4 d	32.3 a	6.0 b c	49.6 a
	P_3	3.0 d	6.4 e f	4.7 b c	3.2 c	41.2 def	2.4 b	36.9 c	1.2 bc	46.9 c	32.5 a	5.8bcd	51.9 a
H_3	P_0	4.0 d	6.3 e f	1.7 def	3.7 c	40.4 e f	2.4 b	20.5 fg	1.2 bc	32.1d -g	24.6 b	4.5 e f	50.0 a
	P_1	1.7 d	5.4 f	1.7 def	2.7 c	54.1 a b	3.1a b	44.1 b	1.4 ab	53.5 c	32.7 a	5.9 b c	46.7 a
	P_2	1.0 d	4.1 f	1.0 f	2.0 c	55.0 a	3.6 a	53.0 a	1.5 a	63.5 b	32.6 a	6.5 a b	47.7 a
	P_3	1.0 d	2.5 f	1.3 e f	1.2 c	58.3 a	3.6 a	54.7 a	1.5 a	76.4 a	34.3 a	6.9 a	49.3 a
Second date													

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H_0	P_0	6.7 a b	46.2 a	5.3 a	25.2 a	45.8 a	2.2 d	13.2 e f	1.1cd	15.0 f	19.8 h	2.5 gh	37.9abc
	P_1	5.0 b c	35.0 b	5.0 a b	15.3 b	45.1 a	2.0 d	12.4 f	1.1 cd	14.1 f	20.3 h	2.8 g	33.4 c
	P_2	7.0 a b	34.7 b	4.7 a b	16.3 b	48.7 a	2.3 d	13.9 def	1.2 cd	15.6ef	21.6f-h	2.6 gh	35.1 b c
	P_3	9.3 a	35.4 b	3.0 b c	14.5 b c	47.3 a	2.7bcd	15.8de f	1.2 cd	18.8ef	20.4 h	2.3 gh	35.0 b c
H_1	P_0	3.0 c d	22.5 c	2.3 c	14.6 b c	44.4 a	2.1 d	13.5 def	1.1 d	19.3df	20.6gh	2.1 h	37.0 abc
	P_1	2.3 cd	20.2 cd	2.0 c	7.6 def	48.4 a	2.6 c d	17.2 c-f	1.1 c d	19.2d-f	22.5 fg	3.5 f	38.0 abc
	P_2	3.3 c d	22.3 c	2.0 c	8.7 de	49.9 a	2.5 c d	17.1 c-f	1.1 d	19.5d-f	23.1 ef	3.5 f	38.4 abc
	P_3	1.7 d	11.8d e	2.0 c	10.9 cd	48.1 a	2.2 d	19.0 cde	1.2 c d	21.2 de	24.8 de	3.7 e f	36.0 b c
H_2	P_0	1.7 d	10.9e f	2.0 c	3.8 f	47.8 a	2.1 d	14.4 def	1.2 c d	17.8 ef	21.3f-h	2.7 g	36.0 b c
	P_1	1.7 d	8.5 e f	2.3 c	5.6 e f	44.3 a	2.7bcd	16.3 def	1.1 c d	16.0 ef	25.4c d	4.2 d e	34.3 b c
	P_2	2.7 c d	10.8e f	1.3 c	4.4 f	47.0 a	2.3 d	19.2 c d	1.2 c d	17.2 ef	26.3c d	4.8 c d	34.8 b c
	P_3	1.7 d	10.2e f	2.0 c	5.5 e f	43.7 a	2.1 d	22.4 b c	1.3b-d	24.9 d	27.0 c	5.0 b c	35.7 b c
H_3	P_0	1.7 d	8.0 e f	1.0 c	4.2 f	47.7 a	2.4 c d	26.8 b	1.1 c d	30.7 c	21.2f-h	2.7 g h	35.8 b c
	P_1	1.0 d	6.3 e f	1.3 c	3.4 f	44.3 a	3.1 abc	26.7 b	1.5 a	39.9 b	31.3 b	4.8 bcd	45.5 a
	P_2	1.0 d	4.3 e f	1.0 c	4.4 f	46.0 a	3.4 a b	34.4 a	1.3a-c	37.3 b	32.6 b	5.4 a b	45.0 a
	P_3	1.0 d	3.3 f	1.0 c	3.7 f	46.0 a	3.6 a	40.0 a	1.5 ab	46.3 a	34.6 a	5.7 a	42.9 a b

Means in each column followed by the same letter are not significantly different at the 5% probability level according to Duncan's Multiple Range Test.

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Table (6) shows the analysis of triple interaction between treflan herbicide , phosphorus levels and planting date on weeds and chickpea yield in both of plating dates. The results exhibited significant effect of herbicide level in the whole traits . Also the phosphorus level produced considerably effect with the exception of plant height and number of branches plant^{-1}. The planting dates gave remarkably effect on the whole of studied traits. According to the means square values the results showed that the interaction between herbicide and phosphorus levels resulted significant effect on all examined traits except plant height and number of branches plant^{-1} nevertheless the interaction between herbicide and planting date was realized significant effect studied traits. The interaction between phosphorus and planting date gave partial effect on examined traits with the except of dry weight of narrow leaved weeds, number of primary branches plant^{-1} , seeds pod^{-1} and height of the lowest pod. The trill interaction between herbicide, phosphorus and planting dates produced significant effect on studied traits except number of broad leaved weeds, dry weight of narrow leaved weeds, plant height and number of primary branches plant^{-1}. These results were in agreement with the results proved by Kumar and Sreenivasvly, (2004) . and Mahajan and Sharma, (2005).

Table (6): Combined analysis of treflan herbicide and phosphorus application on weeds and chickpea yield .

S.O.V	df	MS											
		No. of broad leaved weeds/m^2	Dry weight of broad leaved weeds g/m^2	No. of narrow leaved weeds/m^2	dry weight of narrow leaved weeds(g/m^2	plant height (cm)	No. of primary branches plant^{-1}	No. of pods plant^{-1}	No. of seeds pod^{-1}	No. Seeds plant^{-1})	100 grain weight (g)	Grain weight plant^{-1} (g	Height of the lowest pod
block	2	4.59 *	1.89	0.125 *	73.6 *	2.21	142.72**	2.09	0.44 **	0.026	2.19 *	0.07	5.98 *
H	3	1206.3**	7861.9 **	243.70**	39068.**	65.27 *	55.29 *	2050.0**	3464 .**	0.251 **	423.68**	19.18 **	353.61**
P	3	26.45 **	389.86 **	4.899 **	563.3 *	3.87	0.28	531.81**	523.2 **	0.050 **	165.5 **	11.79 **	23.72*
T	1	1433.8**	983.94 **	276.76**	28400.**	697.8 **	152.01**	1958.7**	4732 .**	0.031 **	75.26 **	46.97 **	1426.0**
H x P	9	9.39 *	58.55 **	2.464 **	505.1 **	8.69	3.29	105.71**	186.8 **	0.021 **	29.65 **	1.59 **	78.38**
H x T	3	487.23**	536 **	71.344**	28526 **.	53.58 *	70.7 *	81.98 **	214.61 *	0.015 **	12.76 **	0.24 **	20.8 *
P x T	3	40.29 **	54.5 **	4.872 **	255.5	21.93 *	1.64	79.95 **	72.24	0.003 **	2.52 **	0.28 **	16.81
H x P x T	9	8.72	18.76 **	0.751 *	374.1	6.15	2.66	50.12 **	64.84 *	0.009 **	8.43 **	0.19 **	28.04**
Error	62	4.58	6.62	0.673	185.2	17.01	19.55	4.46	5.1	0.004	0.60	0.05	6.58
Total	95										2.19		5.98

****,** indicating significant difference at 0. 05 and 0.01 probability level respectively. H – Herbicide, P- Phosphor levels. T- Planting time

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Table 7. Exhibited the effect of each of treflan herbicide, phosphorous levels and planting dates on studied characters. that the check treatment gave the maximum values for number and dry weight of broad and narrow leaved weight compared with H3 level and recoded 17.1, 44.3 g, 8.6 and 86.7 g. While, the H3 level record the lowest values for all mentioned traits and the values were 1.5, 5 g, 1.3 and 3.2. Concerning yield and yield component, the H3 level perceived the maximum values(37.5, 1.4, 47.5,30.5 g, 5.3g and 47.1 cm for number of pod plant-1, seed pod-1, seeds plant-1, 100-grain weight, grain yield plant-1 and height of the lowest pod, respectively. Thus the herbicide (H3 level) was effective to play a role and killed far of broad and narrow leaved eweds. Regarding the phosphorous level the table 7 realized that the P_3 level gave the highest value for yield and yield component of chickpea and the same level recorded (3.8, 29.6, 1.3, 36.7, 27.7 g ,4.8 and 42.5) for each of number of primary branches plant, pods plant^{-1}, seeds pod^{-1}, seeds plant^{-1} , 100-grain weight, grain yield per plant and height of the lowest pod, respectively. According to results in the Table (7) the second planting date recorded the lowest values for number and dry weight of broad and narrow leaved weeds, whereas the first planting date was worthily significant for yield and yield component compared with the second planting date, this means the first planting date was appropriate for growth the chickpea plant. Similar trends were found by Yadav, (1988) and Bhallq etal., (1998).

Table (7): Effect of herbicide, phosphorus levels and planting date separately on weed and chickpea yield.

	No. of broad leaved weeds /m^2	Dry weight of broad leaved weeds g/m^2	No. of narrow leaved weeds/ m^2	dry weight of narrow leaved weeds (g/m^2	plant height (cm)	No. of primary branches plant^{-1}	No. of pods plant^{-1}	No. of seeds pod^{-1}	No. Seeds plant^{-1})	100 grain weight (g)	Grain weight plant^{-1} (g	Height of the lowest pod
H_0	17.1a	44.3 a	8.6 a	86.7 a	51.2 a	5.9 a	16.1 d	1.2 b	20.1 d	20.7 d	3.3 d	39.1 b
H_1	6.8 b	27.2 b	3.7 b	11.7 b	49.5 a b	3.8 a b	20.6 c	1.2 b	24.6 c	23.7 c	4.1 c	40.0 b
H_2	2.7 c	8.9 c	2.8 c	4.2 b	49.0 a b	2.5 b	24.5 b	1.2 b	29.2 b	26.8 b	4.8 b	39.4 b
H_3	1.5 c	5.0 d	1.3 d	3.2 b	47.2 b	2.9 a b	37.5 a	1.4 a	47.5 a	30.5 a	5.3 a	47.1 a
N_0	8.4 a	27.0 a	4.7 a	32.9 a	49.8 a	3.8 a	18.8 d	1.2 b	25.7 d	21.8 d	3.3 c	40.1 b
N_1	7.3 ab	21.2 b	4.0 b	27.3 a b	48.9 a	3.9 a	23.1 c	1.2 a	28.6 c	25.3 c	4.4 b	41.3 a b
N_2	6.0 b	19.7 b	3.6 b	23.6 a b	49.2 a	3.6 a	27.1 b	1.2 a	30.3 b	27.0 b	4.8 a	41.7 a b
N_3	6.5 b	17.6 c	4.2 a b	22.0 b	49.0 a	3.8 a	29.6 a	1.3 a	36.7 a	27.7 a	4.8 a	42.5 a
D_1	10.9a	24.6 a	5.8 a	43.7 a	51.9 a	5.0 a	29.2 a	1.2 a	37.3 a	26.3 a	5.1 a	45.3 a
D_2	3.2 b	18.2 b	2.4 b	9.3 b	46.5 b	2.5 b	20.2 b	1.2 b	23.3 b	24.5 b	3.7 b	37.6 b

Means in each column followed by the same letter are not significantly different at the 5% probability level according to Duncan's Multiple Range Test.

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Table (8) clarified the interaction effect between treflan herbicide and phosphorous levels on weed and chickpea yield as mean of both planting dates. We can notice the total of three levels of herbicide were tested for weed control in chick pea, the efficiency of herbicide level was rated in comparison with control as 97 and 99% for broad and narrow leaved weeds, respectively. The results revealed that differences due to different herbicide levels were found non-significant with regard to number and dry weight of broad and narrow leaved weeds. In general, the maximum number and dry weight were observed under check treatment. Furtherhore, plant height and number of primary plant^{-1} of chickpea was also found non-significant due to the interaction between herbicide and phosphorus levels. Number of seeds pod^{-1}, seeds plant $^{-1}$, 100-grain weight, grain yield plant^{-1} and height of lowest pod were significantly influenced due to interaction between herbicide and phosphorous levels and H_3 level was found superior and registered higher values for above traits as compare to all other treatments and the values which were 1.5, 61.3, 34.5 g, 6.3 g and 50.6 consequence. The maximum number of pod plant^{-1}, seeds pod^{-1}, 100-grain weight, grain weight plant and height of the lowest pod under above said treatment might be duo to effective control of weed at critical crop-weed competition stages, which might have helped in increasing nutrient formation of bold seeds, and consequently increase in the above traits. Similar results were also reported by Upadhyay and Bhalla (2002).

Table (8). Interaction effect between treflan herbicide and phosphorus levels on weeds and chickpea yield as average of both planting dates.

H	P	No. of broad leaved weeds/ m^2	Dry weight of broad leaved weeds g/m^2	No. of narrow leaved weeds/ m^2	dry weight of narrow leaved weeds(g/m^2	plant height (cm)	No. of primary branches plant^{-1}	No. of pods plant^{-1}	No. of seeds pod^{-1}	No. Seeds plant^{-1})	100 grain weight (g)	Grain weight plant^{-1} (g	Height of the lowest pod
H_0	p_0	16.8 a	54.6 a	9.8 a	110.7 a	51.6 a	4.9 a	13.9 h	1.2 b	19.7g h	20.6 h	3.1g h	39.1 b
	p_1	17.7 a	44.4 b	8.3 a b	75.8 b	50.3 a	5.7 a	13.5 h	1.2 b	18.3 h	20.4 h	3.4 fg	37.6 b
	p_2	15.8 a	39.1 c	8.5 a b	68.9 b	51.3 a	6.2 a	17.6 g h	1.2 b	20.3 gh	21.1 h	3.6 f	38.6 b
	p_3	18.2 a	39.1 c	7.8 b	91.4 ab	51.6 a	6.7 a	19.2 f g	1.2 b	21.9fgh	20.9 h	2.9 h	41.1 b
H_1	p_0	9.5 b	34.0 c	4.5 c	13.5 c	48.2 a	4.4 a	18.4 f g	1.1 b	24.0efg	20.3 h	3.1 gh	42.7 b
	p_1	8.2 b c	27.1 d	2.8 c-g	10.8 c	50.2 a	4.7 a	21.3 efg	1.2 b	23.4efg	23.9efg	4.1 e	38.7 b
	p_2	4.8 c d	27.7 d	3.2 cde	11.5 c	50.4 a	3.2 a	20.6 efg	1.2 b	23.3efg	25.1 d e	4.3 de	38.6 b
	p_3	4.5 c d	20.1 e	4.3 c	11.0 c	49.0 a	3.0 a	22.1 e f	1.2 b	27.7 d e	25.5 d	4.7 cd	39.9 b
H_2	p_0	4.3 c d	12.2 f	3.0 c-f	3.5 c	50.5 a	3.2 a	19.4 efg	1.2 b	27.7 d e	23.4 f g	3.6 fg	40.6 b
	p_1	2.0 d	7.4 fgh	3.2 cde	4.6 c	49.4 a	2.5 a	22.3 d e f	1.2 b	25.9 e f	24.9def	4.8 c	39.0 b
	p_2	2.2 d	7.6 fgh	1.7 d-h	4.6 c	48.3 a	2.1 a	26.7 c d	1.2 b	27.3 d e	29.3 c	5.4 b	39.6 b
	p_3	2.3 d	8.3 f g	3.3 c d	4.4 c	47.8 a	2.2 a	29.7 c	1.2 b	35.9 c	29.7 c	5.4 b	38.5 b
H_3	p_0	2.8 d	7.2 fgh	1.3 fgh	4.0 c	48.8 a	2.7 a	23.7 d e	1.2 b	31.4 c d	22.9 g	3.6 f	38.1 b
	p_1	1.3 d	5.8 gh	1.5 eh	3.0 c	45.5 a	2.7 a	35.4 b	1.4 a	46.7 b	32.0 b	5.4 b	49.8 a
	p_2	1.0 d	4.2 gh	1.0 h	3.2 c	46.9 a	3.0 a,	43.7 a	1.4 a	50.4 b	32.6 b	6.0 a	50.0 a
	p_3	1.0 d	2.9 h	1.2 g h	2.4 c	47.7 a	3.2 a	47.3 a	1.5 a	61.3 a	34.5 a	6.3 a	50.6 a

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Means in each column followed by the same letter are not significantly different at the 5% probability level according to Duncan's Multiple Range Test.

The data in table 9. described an interaction effect between each of treflan herbicide ,phosphorus levels with planting dates. The check treatment in first date was superior in number and dry weight of broad and narrow leaved weeds and recorded 27.2, 50.8 g, 12.8 and 55.6 g while, the H_3 level in second date of planting remarked the highest values for above traits and perceived 12.0, 4.6 g ,1.1, and 2.4, respectively. For plant height and number of branches plant^{-1} recognized the highest values obtained by check treatment in first planting date, the values were 55.6 cm and 55.7. Regarding yield and yield components the H_3 level in first planting date realized the maximum values (43.1, 56,4, 31.0 g , 6.0 g, and 52.0 cm for number of pod plant^{-1}, seeds plant^{-1}, 100- grain weight, grain weight plant^{-1} and height of the lowest pod, respectively. The results showed that the P_0 level in first planting date gave the maximum values (13.5, 32.1 g, 6.7 and 58.9 g, 53.2 cm)., for number and dry weight of broad and narrow leaved weeds and plant height respectively ,as . Whereas, the P_3 level in first planting date recorded the highest values (34.8, 1.3, 45.6, 28.6 g and 47.6 cm. for number of pods plant^{-1}, seeds pod^{-1}, seeds plant^{-1}, 100-grain weight, grain weight plant^{-1} and height of the lowest pod.

The highest density and dry weight of weeds were produced by control treatment as compared to rest of treatments. All herbicide and phosphorus levels gave a good indicator to increase yield and yield components and reduced in the number of broad and narrow leaved weeds. The results Compatible with (Thorat 2004 and Patel *et al* 2006).

Table(9): Interaction effect between each of treflan herbicide and phosphorus levels with planting date on weeds and chickpea yield .

H	D	No. of broad leaved weeds/ m^2	Dry weight of broad leaved weeds g/m^2	No. of narrow leaved weeds/m^2	dry weight of narrow leaved weeds(g/ m^2	plant height (cm)	No. of primary branches plant^{-1}	No. of pods plant^{-1}	No. of seeds pod^{-1}	No. Seeds plant^{-1})	100 grain weight (g)	Grain weight plant^{-1} (g	Height of the lowest pod
H_0	D_1	27.2 a	50.8 a	12.8 a	155.6 a	55.7 a	9.5 a	18.3 d	1.2 b c	24.3 d	20.9 f	3.9 d	42.8 b
	D_2	7.0 c	37.8 b	4.5 b c	17.8 b	46.7cd	2.3 b	13.8 e	1.2 b c	15.9 f	20.5 f	2.6 f	35.4 c
H_1	D_1	10.9 b	35.2 b	5.3 b	12.9 b	51.2abc	5.3 a b	24.5 c	1.2 b	29.4 c	24.6 d	4.9 c	42.6 b
	D_2	2.6 d	19.2 c	2.1 d	10.5 b	47.7bcd	2.3 b	16.7 d	1.1 c	19.8 e	22.7 e	3.2 e	37.4 c
H_2	D_1	3.5 d	7.7 d e	3.7 c	3.7 b	52.3 a b	2.7 b	30.9 b	1.2 b	39.4 b	28.7 c	5.4 b	43.6 b
	D_2	1.9 d	10.1 d	1.9 d	4.8 b	45.7 d	2.3 b	18.1 d	1.2 b	19.0 e	25.0 d	4.2 d	35.2 c
H_3	D_1	1.9 d	5.5 e	1.4 d	3.9 b	48.4 bcd	2.7 b	43.1 a	1.4 a	56.4 a	31.0 a	6.0 a	52.0 a
	D_2	1.2 d	4.6 e	1.1 d	2.4 b	46.0 c d	3.1 b	32.0 b	1.4 a	38.5 b	29.9 b	4.6 c	42.3 b
p_0	D_1	13.5 a	32.1 a	6.7 a	53.9 a	53.2 a	5.4 a	20.7de	1.2 b c	30.7 d	22.9 e	4.2 c	43.6 b
	D_2	3.2 d	21.9 bc	6.3 a	11.9 c	46.4 b	2.2 a	17.0 f	1.1 c	20.7 e	20.7 f	2.5 e	36.7 c
p_1	D_1	12.1a b	24.9 b	5.3 b	39.2 a b	52.2 a	5.2 a	28.1 b	1.2a b	34.8 c	25.7 cd	5.0 b	44.7 ab
	D_2	2.5 d	17.5 ef	4.9 b	8.0 c	45.5 b	2.6 a	18.2ef	1.2 ab	22.3 e	24.9 d	3.8 d	37.8 c
p_2	D_1	8.4 c	21.3 cd	2.7 c	35.6 b	50.6 a b	4.6 a	33.1 a	1.3 ab	38.2 b	28.1 a	5.5 a	45.1ab
	D_2	3.5 d	18.0def	2.7 c	8.4 c	47.9 a b	2.6 a	21.2 d	1.2abc	22.4 e	25.9b c	4.1 c d	38.3 c
p_3	D_1	9.6 b c	20.0cde	2.2 c	45.9 a b	51.8 a	4.9 a	34.8 a	1.3 a	45.6 a	28.6 a	5.5 a	47.6 a

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D_2	3.4	d	15.2	f	2.0	c	8.7	c	46.3	b	2.6	a	24.3	c	1.3	ab	27.8	d	26.7	b	4.2	c	37.4	c

Means in each column followed by the same letter are not significantly different at the 5% probability level according to Duncan's Multiple Range Test.

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Table (10) shows the triple interaction effect between treflan herbicide (H), phosphorous (P) and planting date (T). The interaction (H_0 P_0 D_1) gave the highest number and dry weight of broad and narrow leaved weeds which recorded (27.0, 63.0 g, 14.3, 96.2 g and plant height 57.4 cm) while, the minimum values were (1.0, 2.5 g, 1.0, and 1.2 g) for the above traits recorded by H_3 P_3 D_2 and H_3 P_3 D_1. For the primary branches plant^{-1}, the results showed non-significant effect by interaction between herbicide, phosphorous and planting dates. Whereas the interaction H_3 P_3 D_1 gave the maximum values which were 1.5t, 76.4, 34.3 g, 6.9 g and 58.3 cm for number of seed pod-1, seeds plant-^{1}, 100-grain weight, grain yield plant^{-1} and height of the lowest pod. Form the results above all different levels of herbicide and phosphorous level were more effective to kill the broad and narrow leaved weeds in first stage of chickpea growth and help chickpea plant to improve the crop growth and useful from the different levels of phosphorous applications and increasing yield and yield components of chickpea plant. These results were consistent with the results proved by (Upadhyay and Bhalla, 2002 and Patel *et al.*,

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Table (10): Effect of Interaction between treflan herbicide, phosphorus levels and planting dates on weeds and chickpea yield.

H	N	D	No of broad leaf weeds/m^2	Dry weight of broad leaf weeds g/m^2	No of narrow leaf weeds/m^2	dry weight of narrow leaf weeds(g/m^2	plant height (cm)	No. of primary branches $plant^{-1}$	No. of pods $plant^{-1}$	No. of seeds pod^{-1}	No. Seeds $plant^{-1}$)	100 grain weight (g)	Grain yield g m^{-1}	Height of the lowest pod
H_0	P_0	D_1	27.0 a	63.0 a	14.3 a	196.2 a	57.4 a	7.7 a	14.7 klm	1.2cd e	24.4j-n	21.3ghi	3.7k l	40.3c-j
		D_2	6.7 d e	46.2 bc	5.3 c d	25.2 d	45.8 a b	2.2 a	13.2 m	1.1 d e	15.0 p	19.8 i	2.5o p	37.9e-j
	P_1	D_1	30.3 a	53.9 b	11.7 b	136.4bc	55.6 a b	9.3 a	14.6 klm	1.2cd e	22.6ko	20.4 h i	4.0jkl	41.8c-i
		D_2	5.0 d e	35.0 e f	5.0 c d	15.3 d	45.1 a b	2.0 a	12.4 m	1.1 d e	14.1p	20.3 h i	2.8no	33.4 j
	P_2	D_1	24.7 a	43.4 cd	12.3a b	121.5 c	54.0 a b	10.1 a	21.3 f-k	1.1 d e	25.0im	20.5 h i	4.5 hij	42.1c-i
		D_2	7.0 d e	34.7 e f	4.7 cde	16.3 d	48.7 a b	2.3 a	13.9 lm	1.2 cde	15.6 op	21.6ghi	2.6 o p	35. h ij
	P_3	D_1	27.0 a	42.9ce	12.7a b	168.2ab	55.9 ab	10.8 a	22.5 e- j	1.2 cde	25.1im	21.3ghi	3.5lmn	47.1bcd
		D_2	9.3 b c d	35.4def	3.0 d-i	14.5 d	47.3 a b	2.7 a	15.8 j-m	1.2 cde	18.8mp	20.4 h i	2.3 o p	35.0 hij
H_1	P_0	D_1	16.0 b	45.5 c	6.7 c	12.5 d	51.9 a b	6.8 a	23.2 e-i	1.2 cde	28.6g-k	19.9 i	4.1 i-l	48.5 b c
		D_2	3.0 d e	22.5 g	2.3 e- i	14.6 d	44.4 a b	2.1 a	13.5 m	1.1 e	19.3m-p	20.6gh i	2.1 p	37.0 f- j
	P_1	D_1	14.0 b c	34.0 f	3.7 d-h	13.9 d	52.1 a b	6.9 a	25.4 e f g	1.2 cd e	27.5h-l	25.3 cde	4.7 g-j	39.3 d-j
		D_2	2.3 e	20.2 g h	2.0 f-i	7.6 d	48.4 a b	2.6 a	17.2 h-m	1.1 e	19.2m-p	22.5 f gh	3.5 l-m	38.0 e-j
	P_2	D_1	6.3 d e	33.2 f	4.3 c-f	14.2 d	51.0 a b	3.9 a	24.0 e-h	1.3 b-e	27.1h-l	27.0 c	5.1 d-h	38.9 d -j
		D_2	3.3 d e	22.3 g	2.0 f-i	8.7 d	49.9 a b	2.5 a	17.1 i-m	1.1 e	19.5m-p	23.1 e f g	3.5 l m	38.4 e-j
	P_3	D_1	7.3 c d e	28.4 f g	6.7 c	11.1 d	50.0 a b	3.8 a	25.2 e f g	1.2 c de	34.2e-h	26.3 c d	5.7 cde	43.8 c-g
		D_2	1.7 e	11.8 i j	2.0 f-i	10.9 d	48.1 a b	2.2 a	19.0 g-m	1.2 d e	21.2l-p	24.8 c-f	3.7 k l	36.0 g-j
H_2	P_0	D_1	7.0 d e	13.5 h i	4.0 d-g	3.2 d	53.3 a b	4.3 a	24.3 e f g	1.2 cd e	37.6 e f	25.6 c d	4.4 h-k	45.2 c-f

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		D_2	1.7 e	10.9 i jk	2.0 f-i	3.8 d	47.8 a b	2.1 a	14.4 l m	1.2 cd e	17.8m-p	21.3 g h i	2.7 nop	36.0 g-j
	P_1	D_1	2.3 e	6.3 i-l	4.0 d-g	3.6 d	54.4 a b	2.2 a	28.3 d e	1.2 cde	35.7efg	24.4 d e f	5.5 cf	43.6 c-g
		D_2	1.7 e	8.5 i-l	2.3 e-i	5.6 d	44.3 a b	2.7 a	16.3 j-m	1.1 d e	16.0 o p	25.4 cd e	4.2 i-l	34.3 i j
	P_2	D_1	1.7 e	4.5 j k l	2.0 f-i	4.8 d	49.6 a b	1.9 a	34.1 c d	1.2 cde	37.4 e f	32.3 a b	6.0 b c	44.5 c-f
		D_2	2.7 d e	10.8 i-l	1.3 h i	4.4 d	47.0 a b	2.3 a	19.2 g-m	1.2 cde	17.2nop	26.3 c d	4.8 f-i	34.8 hij
	P_3	D_1	3.0 d e	6.4 i-l	4.7c d e	3.2 d	51.9 a b	2.2 a	36.9 c	1.2c d e	46.9 c d	32.5 a b	5.8 bcd	41.2 c-j
		D_2	1.7 e	10.2 i-l	2.0 f-i	5.5 d	43.7 b	2.1 a	22.4 e-j	1.3c d e	24.9 i-m	27.0 c	5.0 e-h	35.7 g-j
H_3	P_0	D_1	4.0 d e	6.3 i-l	1.7 g h i	3.7 d	50.0 a b	2.9 a	20.5 f-l	1.2 cd e	32.1 f-i	24.6 c-f	4.5 h i j	40.4 c-j
		D_2	1.7 e	8.0 i-l	1.0 i	4.2 d	47.7 a b	2.4 a	26.8 e f	1.1 d e	30.7 f-j	21.2 g h i	2.7 o p	35.8 g-j
	P_1	D_1	1.7 e	5.4 i-l	1.7 g h i	2.7 d	46.7 a b	2.3 a	44.1 b	1.4a b c	53.5 c	32.7 a b	5.9 b c	54.1 a b
		D_2	1.0 e	6.3 i-l	1.3 h i	3.4 d	44.3 a b	3.1 a	26.7 e f	1.5 a	39.9 d e	31.3 b	4.8 f-i	45.5 cde
	P_2	D_1	1.0 e	4.1 j k l	1.0 i	2.0 d	47.7 a b	2.7 a	53.0 a	1.5 a b	63.5 b	32.6 a b	6.5 a b	55.0 a b
		D_2	1.0 e	4.3 j k l	1.0 i	4.4 d	46.0 a b	3.4 a	34.4 c d	1.3 a-d	37.3 e f	32.6 a b	5.4 c-g	45.0 c-f
	P_3	D_1	1.0 e	2.5 l	1.3 h i	1.2 d	49.3 a b	2.8 a	54.7 a	1.5 a	76.4 a	34.3 a	6.9 a	58.3 a
		D_2	1.0 e	3.3 k l	1.0 i	3.7 d	46.0 a b	3.6 a	40.0 b c	1.5 a b	46.3 c d	34.6 a	5.7 cde	42.9 c-h

Means in each column followed by the same letter are not significantly different at the 5% probability level according to Duncan's Multiple Range Test

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REFERENCES

- Ahlawat, I. P. S., Singh, A. and Saraf , C, S. 1981.Effect of winter legumes on the nitrogen economyand productivity of succeeding cereals. Experimental Agriculture 17: 57-62.
- Auld, P. and Lee, G. A. 1981. Chickpea, a potential pulse crop for northern Idaho. Current Information Services. Idabo Agricultural Experiment Station No. 570.
- Bhalla, U. S. (2002a) Use of Kinetikit and GENESIS for modeling signaling pathways. Meth. Enzymol. ,345: 3-23. (http://doqcs. ncbs.res.in/).
- Bhalla. C. S, S. P. Kurchaniaad, N. R. Paradkar. 1998. Herbicidal weed control in chickpea (*Cicer ariteinum* L.). World weeds, J. (1-2):121-124.
- Faroda, A. S. and Sing R. C. 1981. Weed control in pulses. Pulse Crop Newsletter 1: 50-51.
- Faroda, A. S. and Sing R. C. 1981. Weed control in pulses. Pulse Crop Newsletter 1: 50-51.
- Gawai P.P. and V. S. Pawar. 2007. Nutrient balance under INMS in sorghum chick pea cropping sequence. Indian J. Agric. Res., 41(2): 137-141.
- Gebreyeus, Br, Te, 2014. Response of yield and yield component of Tef [Eragrostis tef(Zucc.) Trotter] to tillage, nutrient, and weed mangment practices in Dura Area, Northern Ethipia. International Scholarly Research Notices. N. 439718. 9-19.
- Hassan, G. Khan. T. 2007. Post emergence herbicides control asphodels tenuifolius in desi chickpea (*Cicer arietinum L.*)Luckv Marwat, Pakistan,Pak. J. weed Sci. Res. 13(1-2, 33-3
- Holmes, R. C, and C. L. Sprague. 2013. Row width affects weed management in Type II black bean. Weed control. 27, 3 P: 538-546.
- Kumar, B. V and Sreenivasulu. 2004. Integrated nutrient management. Sci. Teck: the Hindu, online Edition of India's National newspaper, Thursday 12th August. 2004.
- Mahajan, A and R. Sharma. 2005. Integrated management (INM) system-concept, need and future strategy. Agrobios NewsLetter, 4(3): 29-32.
- Muhammad. A, A-Anwar, A-Arif, M. Nadeem and A. Zahid. 2010. Screening of pre and post emergence herbicides against chick pea (Cicer arietinum L.) weeds under semi rain fed conditions of Pothohar, Pakistan. Pak. J. Weed sci. Res. 16 (4): 421-430.
- Patel, B. D., J. B. Patel and R. B. Patel. 2006. Effect of fertilizer and weed management practices on weed control in chickpea *(Cicer arietinum* L) ander middle Gujarat conditions. Indian J. crop science , 1 (1-2) : 180-183.
- Sawhncy, V., Amarjit , and Singh, R. 1985. Effect of applied nitrate on growth and N- fixation in Cicer arientinum L. Plant and Soil 86: 233-240.
- Sexena, Mc. (1976). Problems and potential of chickpea production in the nineties. Proc. 2 d2 inter, workshop on chickpea improvement, ICRISAT Center, India, pp 13-28.
- Shabeer K. B. Shahbaz. 2015. Effect of phosphorous levels on growth and r. A. B; K. Mian; U. B. Sana; and yield of chick pea (Cicer avetinum L.) varieties. Journal of Natural science Research. 5. 3 164- 176.
- Steel, R. G. D and J. H Torrie, 1984. Principle and procedures of statistics. 2nd ed. MC Graw Hill Book Co-Singapore PP : 172-177.
- Teuwari A. N. Tiwari S. N. Rathi J.P.S. Verma R. N. Tripathi A. K. 2001. Crop weed competition studies having Asphodelus tenuifolius dominated weed community condition under rain fed condition. Ind J. Weed Sci, 33:198-199.
- Thorat, S. T. 2004. Effect of irrigation regimes , weed management and growth regulators on protein and dry pod yield of ground nut grown under polythene mulch. Inter. Arachis – Newsletter, 24 : 45- 47.
- Upadhyay, V. B and C. S. Bhalla. 2002. Efficacy of cultural mechanical and chemical weed control in chickpea *(Cicer aretinumL.).* Indian. J. Weed sci. 34: 141-142.
- Yadav. D. S. and S. B. Sing .(1988). Efficacy of mechanical and chemical weed control in chickpea (*Cicer ariteinum* L.). Ann. Agric.Res. 9 (2): 256 – 258.

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– پوختە
– ئەڤ ڤەکولینە هاتە ئەنجامدان ل زەڤێێن کولیژا چاندنێ/پشکا دەرامەتێن کێلگەیی/زانکویا دهوکێ بو تاقیکرنا کارتێکرنا چار ئاستێن قرکەران، تر فلان **(00000.5)** لیتر بو هێکتارەکی و چار ئاستێن پەینێ فوسفاتی **(000,140.0)**کیلو گرام بو هیکتارەکێ ل سە ر کژوگیاییێن دەرامە تی و پێکهاتێن نوکێ کو هاتبوو چاندن ل دوو ژڤانا **2\20** و **10\3\ 2017** و مامەلێن ڤە کولینێ هاتنە ریزکرن د تاقیکرنە کا فاکتە ری دا و ب دیزاینا کەرتێن تمامکەر یێ هەرەمەکی و ب سێ دووبارە بوونا . ئەنجامان دانە خویاکرن کو کارتێکرنێت بەرچاف هەبون ل ئاستێن قرکەرێ ترفلان و پەینێ فسفوری لسەر هژمار و کێشا هشك یا گژوگیاییێن بە لکَ بەحن و زراف و هە روەسا ل سە ر دەرامەتی و پێکهاتێن وی، و کارتێکرنا پێکڤە یا ئاستێن قرکەر و پەینێ فوسفاتی ل ژڤانێ ئێکێ دا پترین ریژە تومارکر **(1.5** و **76.4و0000.34.3)** بو ژمارا توڤی د کێلگەیی دا و هژمارا توڤی بو رووەکی و کێشا **100** توڤا و دەرامەتێ توڤێ رووەکی و بلنداهیا ئیکە م کێلیك ژ ئەردی ل دویف ئێك .

تأثير مستويات مختلفة من مبيد الترفلان والسماد الفوسفاتي على الادغال وحاصل الحمص.

الخلاصة
نفذت تجربة حقلية في حقل تجارب قسم المحاصيل الحقلية / كلية الزراعة جامعة دهوك لدراسة تأثير اربعة مستويات من مبيد الترفلان (**0 ,2.400,1.200** و**3.200**) لترهكتار$^{-1}$ واربعة مستويات من السماد الفوسفاتي (**0, 140 , 180** و **220)** كغم هكتار$^{-1}$على الادغال وحاصل ومكونات الحمص المزروعة في موعدين **20/ 2** و **10/ 3/ 2017** وقعت المعاملات في تجربة عاملية وتصميم القطاعات العشوائية الكاملة وبثلاث مكررات, اظهرت النتائج تاثيرا واضحا لمستويات مبيد الترفلان ومستويات الفسفور في عدد والوزن الجاف للادغال العريضة والرفيعة الاوراق وكذلك على الحاصل ومكوناته كما اعطى التداخل بين مستويات المبيد ومستوى الفسفور في الموعد الاول اعلى قيم بلغت **(.5 1 ,76.4 , 34.3** غم **, 6.9** غم و **58.3** سم) لعدد البذور قرنة$^{-1}$, عدد البذور نبات$^{-1}$, وزن **100** بذرة, حاصل البذور نبات$^{-1}$ وارتفاع اول قرنة من الارض على التوالي..