EFFECT OF SOYBEAN PLANTING METHODS ON THE EFFICIENCY OF HERBICIDS

1- GROWTH CHARACTERS AND ASSOCIATED WEEDS

BY

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ABSTRACT

Two field experiments were conducted during 1979 and 1980 seasons at the Research and Experimental Station of the Faculty of Agriculture at Moshtohor to study the effect of planting methods (Heraty and Afir) and some weed control treatments on growth characters of soybean and its associated weeds. The weed control treatments were: Linuron (1.0 kg), butralin (2.0 L), oxadiazon (2.0 L.), Metribuzin (0.5 kg), diphenamide (1.5 kg), tridex (1.0 L.), phenisopham (1.0 L.), mixture of linuron with other herbicides by using the half rate in addition to hand hoeing and unweeded treatment. Heraty (wet) method depressed significantly the dry weight of broad-leaved and grass weeds as compared to the afir (dry) method. On the other hand, heraty method significantly increased some growth characters of soybean plants, i.e.,plant height, no. of leaves/plant, dry weight of leaves as well as whole plant over afir (dry) method. The herbicidal combinations used in this study were more effective in controlling weeds and showed good effect on growth characters of soybean as compared with those of single herbicides. The interaction effect was significant on dry weight of weeds and some studied characters of soybean plants.

INTRODUCTION

Soybean (Glycine max, L. Merr) plays an increasing important role in oil and protein production in Egypt. Recently, the production, of oil is not sufficient for local consumption. Thus, improving growth of soybean can be achieved by improving cultural practices, i.e., weed control (Salim, 1978; Freydier, 1979 and 1980 and Al-Marsafy, 1982) as well as planting methods. Weed control is an important cultural practiece to improve the growth of field crops (Duke, et al., 1976; Rafail et al., 1976 and Marriage et al., 1978). At the present time, hand labour is scare during the summer season and this makes mechanical weed control in soybean fields too costly. Thus, using new selective herbicides has become a very useful practice than

hand hoeing in weed control in field crops. The aim of this study is to evaluate the effectiveness of some herbicides under two common methods of soybean planting.

MATERIALS AND METHODS

Two field experiments were carried out at the Research and Experimental Station of Faculty of Agriculture of Moshtohor, Zagazig University, in 1979 and 1980 seasons. The soil texture of the farm was clay loam, pH value was 7.8 and its organic matter content was 1.58%. Each experiment included 30 treatments which were the combinations of two planting methods a-Afir (dry method) and b-Heraty (wet method) while the weed control treatments were:

1- Linuron (Afalon 50% a.i.), N (3, 4-dichlorophenyl)-N-methoxy-N-methyl Urea) at the rate of 1.0 kg/fed.

2- Butralin (Amex 24% a.i.), 2, 6 dinitro-N-5-buty-4-t-butyl aniline at the rate of 2.0 L./fed.

3- Oxadiazon (Ronstar 25% a.i.), 2, tert-butyl-4-(2, 4-dichloro-5-isopropoxy phenyl)- 2-1, 3, 4-oxadiazolin -5-one, at the rate of 2.0 L./fed.

4- Metribuzin (sencor 70% a.i.), 4-amino-6-tetrbutyl-3- (methyl thio)-as-triazine, at the rate of 0.5 kg/fed.

5- Diphenamide (enide 50% a.i.), N, N-dimethyl-2, 2-diphenyl acetamide, at the rate of 1.5 kg./fed.

6- Tridex (Trifluralin + Bladex) 30/15, Trifluralin, N, N-di-n-propyl-2, 6-dinitro 4-(trifluro methyl) aniline; Bladex, 2-chloro-(6-ethylamine)-4-met-thyl-propionitrile-S-triazine, at the rate of 1.5 L./fed.

7- Phenisopham (Dicotex 15% a.i.), Isoprophyl-N-3-(N-ethyl-N-phenyl carbomoyloxy)-phenyl-carbamate, at the rate of 1.0 L./fed.

8- Linuron + Butralin mixture (each at half of the above rate).

9- Linuron + Oxadiazon mixture (each at half of the above rate).

10- Linuron + Metribuzin mixture (each at half of the above rate).

11- Linuron + Diphenamide mixture (each at half of the above rate).

12- Linuron + Tridex mixture (each at half of the above rate).

13- Linuron + Phenisopham mixture (each at half of the above rate).

14- Hand hoeing treatment (three times during the growing season).

15- Control (un-weeded treatment).

All the above herbicide rates were the commercial fromule.

The experiment lay out was a split plot with four replications, planting methods were arranged at random in the main plots and weed control treatments were assigned at random in the sub-plots. The subplot area was 21 m^2 (1/200 fed.).

Soybean variety calland was planted on April 5th 1979 and April 10th 1980 for the first and second seasons, respectively. All herbicides were used as pre-emergence one day after planting except phenisopham herbicide which was used as post-emergence after 30 days after planting. The normal cultural practices of growing soybean were followed as usual. The following data were recorded:

I- **Weeds:**
Weeds were hand pulled at random from one square meter of each plot after 45 and 90 days from planting. Weeds were identified and classified into two groups. i.e. broad-leaved and grass weeds. Dry weight of each group was recorded.

II- **Growth characters of soybean:**
Plant height, no. of leaves/palnt, dry weight of leaves/plant and dry weight of whole plant were obtained on samples of five plants taken at random after 40, 60 and 80 days from planting. The proper statistical combined analysis for the data of the two experimental seasons were followed as outlined by Snedecor and Cochran (1967). Duncans multiple range test (1955) was used to compare the treatment means.

RESULTS AND DISCUSSION

A- Effect of Planting Methods on:

1- Dry weight of weeds:

The domenant broad-leaves weeds after 45 days from sowing were Xanthium sp. (Coocklebur), Chenopodium sp. (Lamb squrter), Portulaca oleraceae (Purslane). Sonchus oleraceus (Sowthistle), Chichorium pumilum (Wild chicory), Rumex dentatus (Sorrel), Amaranthus sp. (Pig weed), Convolvulus arvensis (Morning glory), while at 90 days from sowing Xanthium sp., Portulaca oleraceae, Melilotus indicus (stink clover), Convolvulus arvensis, Galinosoga parviflora (gallant soldier), Midicago hispida (Hol. Bur clover), Euphorbia macalata (spurge, spotted), Ammi majus (grester ammi), Chenopodium sp. and Solanum nigrum (black night shade). Moreover, grass weeds after 45 days from sowing were: Echinochloa colonum (corn panic grass), Gynodon dactylon (bermoda grass) and Digitaria sp. (crab grass), while after 90 days from planting grasses were, Gynodon dactylon, Dinebra retroflexa, Setaria sp. (foxtail) and Gyperus sp. (nut sedage).

Results in Table (1) demonstrate that the dry weight of weeds in the hearaty planting was lower than that of afir method of planting. The results were expected where the heraty planting is considered one of weed control method. In this method most of the germinated weeds killed at the time of sowing soybean seeds.

2- Growth of soybean plants:

Results in Table (2) demonstrate the superiority of heraty over afir method in some growth characters, i.e., plant height, number of leaves per plant, dry weight of leaves per plant and dry weight of the whole plant. Data in Table (2) showed significant differences between heraty and afir methods in number of leaves per plant, dry weight of leaves per plant and dry weight of the whole plant, but difference in plant height was not significant after 80 days from planting. These results reveal the superiority of heraty planting and this superiority could be due to the eradication of most of the growing weeds in early stage of soybean growth.

B- Effect of Weed Control Treatments on:

1- Dry weight of weeds:

The data presented in Table (3) indicate clearly that all weed control treatments decreased significantly the dry weight of broad-leaved and grass weeds as compared

Table (1): Effect of planting methods on dry weight of weeds (gm/m²) after 45 and 90 days from sowing of soybean crop.
(Combined analysis of 1979 and 1980 experiments).

Methods of planting	Days after sowing			
	45		90	
	Broad-leaved	Grasses	Broad-leaved	Grasses
Heraty	10.39b	4.20b	10.98b	8.65b
Afir	12.72a	5.68a	13.33a	11.41a

Table (2): Effect of planting methods on some growth characters in soybean plant after 40, 60 and 80 days from sowing.
(Combined analysis of 1979 and 1980 experiments).

Methods of planting	Plant height in cms	No. of leaves/ plant	Dry weight of leaves/ plant in gms	Dry weight of whole plant in gms
		After 40 days from sowing		
Heraty	23.65a	8.63a	1.86a	3.97a
Afir	21.70a	7.90a	1.69a	3.07b
		After 60 days from sowing		
Heraty	59.42a	27.47a	9.57a	19.40a
Afir	54.01b	26.62a	7.46b	19.01a
		After 80 days from sowing		
Heraty	74.87a	37.26a	16.51a	36.23a
Afir	72.47a	34.51b	14.62b	33.42b

* Means for each character followed by the same alphabetical letters are not statistically different at the 5% level.

Table (3): Effect of some weed control treatments on dry weight of weeds (gm/m²) after 45 and 90 days from sowing.
(Combined analysis of 1979 and 1980 experiments).

Weed control treatments	Days after sowing			
	45		90	
	Broad-leaved	Grasses	Broad-leaved	Grasses
Linuron at 1.0 kg/fad.	12.03e	5.28e	10.16de	10.89f
Butralin at 2.0 L/fad.	15.98g	2.60ab	14.66h	6.45ab
Oxadiazon at 2.0 L/fad.	14.07f	5.11de	13.94gh	8.97cd
Metribuzin at 0.5 kg/fad.	4.83a	2.09a	5.04a	5.80a
Diphenamide at 1.5 kg/fad.	14.62fg	4.74de	14.22gh	10.65ef
Tridex at 1.5 L/fad.	9.69d	4.17cd	9.77de	7.76bc
Phenisopham at 1.0 L/fad.	10.56de	13.85h	11.75ef	14.37g
Linuron + Butralin Mix.*	9.18cd	4.18cd	12.51fg	8.38cd
Linuron + Oxadiazon	7.91bc	5.27e	9.45d	7.81bcd
Linuron + Metribuzin	3.65a	3.03ab	6.53ab	7.42bc
Linuron + Diphenamide	11.91e	5.66ef	12.33fg	11.27f
Linuron + Tridex	6.69b	3.52bc	7.38bc	8.88cd
Linuron + Phenisopham	7.48bc	6.37f	8.71cd	11.58f
Hoeing	10.81de	4.13cd	11.66ef	9.25de
Control	33.89h	11.04g	34.20i	21.02h

* Mixtures rates were half of those of the individual herbicide rates.
Means for each character followed by the same alphabetical letters are no statistically dif ferent at the 5% level.

to the un-weeded treatment. These results hold fairly true at 45 and 90 days from sowing. These results are in agreement with those reported by Kvitko (1967), who stated that the pre-emergance application of linuron at the rate of 3.0 kg/ha. was similar to mechanical and hand weeding. Whil, Salim (1978), found that using butralin at 1.0 L./fed. as pre-emergence in soyean was equal to hoeing in controlling weeds while Al-Marasfy (1982), indicated that the best weed control treatment was the hand hoeing as compared with all other weed control treatment. The available results also indicated that all linuron mixtures with other herbicides were superior in controlling weeds than the similar treatment of the single herbicides with the exception of metribuzin treatment on grass weeds at 45 days from sowing and on both grass and broad-leaved weeds at 90 days from sowing. The present results confirmed the fact that the mixture of herbicides increased the effectiveness of chemical weed control and broadened the weed control spectrum. In this connection, Parochetti, (1972); Schrader (1973); Sarpe et al., (1977); Wilson & Hines (1977); Abd El-Faouf & Fayed (1978) and Freydier (1979) and (1980) reported that the mixtures of herbicides were more effective against weeds in soybean fields than using single herbicides.

2- Growth characters of soybean plant:

a- Plant height:

At the early stage (40 days from sowing) the data show that mixtures of linuron with metribuzin or oxadiazon gave the highest plants followed by tridex (1 L.) and linuron (1 kg/fed.) as separate applications. On the other hand, there was no significant effect on plant height between butralin, oxadizon, diphenamide, phenisopham, linuron-diphenamide mixture and hoeing at 40 days from sowing. At 60 days from sowing the best treatments were, mixtures of linuron with tridex or metribuzin followed by tridex alone and linuron alone. Meanwhile, diphonamide, metribuzin and linuron-diphenamide mixture gave shorter plants at 80 days from sowing as compared to those of other weed control treatments (Table 4).

b- Number of leaves per plant:

The highest number of leaves/plant was recorded with the mixture of linuron-tridex treatment at 40, 60 and 80 days from sowing (Table 4). On the contrary metribuzin at 0.5 kg/fed. gave the lowest no. of leaves/plant at 40 and 60 days from sowing, meanwhile at 80 days from sowing the soybean plants recovered the growth.

Table (4): Effect of some weed control treatments on growth of soybean plant (Combined analysis of 1979 and 1980 experiments).

Weed control treatments	40 days from sowing				60 days from sowing				80 days from sowing			
	Plant height in cms	No. of leaves/plant	Dry weight of leaves/ plant in gms	Dry weight of whole plant in gms	Plant height in cms	No. of leaves/plant	Dry weight of leaves/ plant in gms	Dry weight of whole plant in gms	Plant height in cms	No. of leaves/plant	Dry weight of leaves/ plant in gms	Dry weight of whole plant in gms
Linuron at 1.0 kg/fad.	23.9 ef	8.0 cd	2.06 fg	3.98 e	60.7 f	28.4 e	8.85 cde	20.53 efg	74.8 cd	35.6 de	14.73 cd	35.38 e
Butralin at 2.0 L/fad.	22.9 cde	8.4 def	1.90 fg	3.60 de	57.6 de	31.7 fg	9.00 de	19.68 de	77.8 fg	32.8 bc	13.70 cd	36.15 e
Oxadiazon at 2.0 L/fad.	22.3 bcd	8.7 def	1.84 de	3.68 d	61.0 f	24.4 bc	8.13 cd	17.85 bc	73.7 cd	32.1b b	12.90 bc	31.00 c
Metribuzin at 0.5 kg/fad.	17.3 a	5.8 a	0.84 a	2.18 bc	41.6 a	18.3 a	7.10 b	22.33 fgh	68.4 b	40.1 f	20.68 i	44.88 g
Diphenamide at 1.5 kg/fad.	22.1 bc	8.5 def	1.24 bc	2.55 c	51.8 c	26.4 cd	6.73 b	15.78 ab	66.7 b	30.8 b	11.63 b	27.78 b
Tridex at 1.5 L/fad.	24.1 ef	8.8 efg	2.09 g	4.25 g	60.5 f	31.2 fg	9.45 e	20.15 def	81.0 h	35.4 de	16.98 efg	40.98 f
Phenisopham at 1.0 L/fad.	22.7 cde	7.6 bc	1.67 d	3.55 d	55.4 d	23.6 b	8.10 c	16.53 abc	75.9 def	36.9 de	14.58 cd	31.18 c
Linuron + Butralin Mix. *	23.3 ed	8.8 fg	1.98 efg	4.03 e	58.8 ef	29.7 ef	8.43 cd	21.10 fgh	77.2 efg	37.6 e	17.20 efg	36.45 e
Linuron + Oxadiazon	24.9 f	9.0 fg	2.06 fg	3.68 d	59.9 ef	28.0 de	8.90 cde	18.13 cd	72.4 c	35.1 cd	15.18 de	34.00 de
Linuron + Metribuzin	24.9 f	8.7 ef	2.41 h	4.55 g	65.2 g	36.1 h	11.48 f	23.05 h	79.3 gh	42.6 f	19.88 hi	45.05 g
Linuron + Diphenamide	22.7 cde	8.5 de	1.35 c	2.73 bc	51.9 c	23.8 b	6.80 b	16.25 abc	68.3 b	36.7 de	15.58 def	27.68 b
Linuron + Tridex	22.9 cde	9.3 g	2.40 h	4.55 g	65.1 g	32.9 g	11.45 f	22.55 gh	84.0 i	41.4 f	18.50 gh	41.23 f
Linuron + Phenisopham	22.2 bcd	8.1 cd	1.87 ef	3.70 d	56.2 d	25.8 bc	8.28 cd	19.58 de	74.9 cde	40.0 f	17.50 fgh	32.83 cd
Hoeing	21.1 cde	8.5 def	1.88 ef	3.90 e	59.8 ef	27.7 de	9.38 e	20.15 def	72.7 c	34.7 cd	14.85 cd	35.60 e
Control	20.8 b	7.1 b	1.11 b	1.93 a	45.1 b	17.7 a	5.73 a	14.50 a	58.0 a	26.6 a	9.58 a	22.25 a

* Mixtures rate were half of those of the individual herbicide rates.
Mean foreach character followed by the same alphabetical letters are not different significant at 5% level.

c- **Dry weight of leaves per plant:**

Results in Table (4) demonstrate that there were significant differences between all weed control treatments and the un-weeded one. This was true at all stages of growth with the exception of diphenamide (1.5 kg/fed.) at 40 days from sowing. The best treatment at 40 and 60 days from sowing was the mixtures of linuron with metribuzin or tridex, but at the later stage (80 days from sowing) was metribuzin as well as its combination with linuron. On the other hand, the lowest value at 40 days from sowing was obtained from metribuzin (0.5 kg/fed.), but at 60 and 80 days, diphenamide (1.5 kg/fed.) was the lowest one.

d- **Dry weight of the whole plant:**

Data presented in Table (4) show significant differences in dry weight of soybean plant among all weed control treatments under investigation. The best treatment in this respect at the three stages of growth was the linuron-metribuzin mixture which increased the dry weight of whole plant by 135.8, 58.9 and 102.5% on the un-weeded treatments at 40, 60 and 80 days after sowing, respectively. On the contrary, the worst effect of weed control treatments were metribuzin (0.5 kg/fed.) after 40 days from sowing and diphenamide at 1.5 kg/fed. and its combination with linuron after 60 and 80 days from sowing.

The metribuzin herbicide caused significant injury to plant growth (plant height, no. of leaves and plant dry weight) at the early stage of growth, but at the latest stage (80 days from sowing) of growth plants seemed to be recovered (Table 4). This last finding confirmed the data obtained by Duke et al., (1976); Rafail et al., (1976) and Marriage et al., (1978). They showed that metribuzin at rates of 0.56-1.12 kg/ha. caused injury to soybean crop. Duke et al. (1976), showed significant reduction at the final stages as well as in plant heights. Concerning the other weed control treatments under investigation, the present results are in harmony with those reported by many workers, Rose and Williams (1969); Abernathy & Wax (1971) and Johnson (1971). Roshdy (1979), stated that linuron at the rate of 0.75 or 1.5 kg/fed. had no effect on soybean height and dry weight of plants at 30, 60 and 90 days from sowing, but butralin at 2.5 L./fed. increasing the number of leaves after 60 days from sowing than hoeing treatment.

Table (5): Effect of the interaction of methods of planting with some weed control treatments on dry weight of weeds (gm/m²) after 45 and 90 days from sowing of soybean crop. (Combined analysis of 1979 and 1980 experiments).

Methods of planting	After 45 days from sowing				After 90 days from sowing			
	Broad-leaved		Grasses		Broad-leaved		Grasses	
Weed control treatments	Heraty	Afir	Heraty	Afir	Heraty	Afir	Heraty	Afir
Linuron at 1.0 kg/fad.	10.18	13.88	4.76	5.79	8.90	11.41	9.89	11.89
Butralin at 2.0 L/fad.	13.82	18.15	2.32	2.89	13.43	15.90	5.18	7.72
Oxadiazon at 2.0 L/fad.	12.31	15.80	4.95	5.26	13.01	14.86	8.38	9.56
Metribuzin at 0.5 kg/fad.	4.09	5.57	1.84	2.35	3.67	6.42	4.84	6.76
Diphenamide at 1.5 kg/fad.	13.24	16.00	3.70	5.79	14.05	14.40	8.91	12.39
Tridex at 1.5 L/fad.	7.96	11.43	3.34	5.00	9.12	10.42	6.80	8.73
Phenisopham at 1.0 L/fad.	9.88	11.25	6.41	7.44	11.40	12.10	12.43	16.29
Linuron + Butralin Mix. *	8.20	10.15	3.28	5.08	11.57	13.45	6.83	9.89
Linuron + Oxadiazon	6.94	8.88	4.63	5.91	7.38	11.52	7.23	8.39
Linuron + Metribuzin	3.31	3.99	2.11	3.94	5.19	7.87	7.06	7.78
Linuron + Diphenamide	11.38	12.44	4.83	6.50	10.51	14.16	8.77	13.77
Linuron + Tridex	6.48	6.91	2.81	4.23	6.79	7.98	7.87	9.91
Linuron + Phenisopham	7.80	7.17	5.55	7.19	7.72	9.70	9.68	13.48
Hoeing	9.85	11.78	3.36	4.91	10.76	12.56	7.62	10.88
Control	30.39	37.39	9.07	13.01	31.13	37.28	18.25	23.80
L.S.D. at 5% level	2.45		N.S		N.S		1.74	

* Mixture tates were half of those of the individual herbicide rates.

Table (6): Effect of the interaction of planting methods with some weed control treatments on some growth characters in soybean crop after 40 days from sowing. (Combined analysis of 1979 and 1980 experiments).

Methods of planting	Plant height in cms.		No. of leaves plant.		Dry weight/ plant of leaves in gms		Dry weight of whole plant in gms	
Weed control treatments	Heraty	Afir	Heraty	Afir	Heraty	Afir	Heraty	Afir
Linuron at 1.0 kg/fad.	24.88	22.96	8.19	7.81	2.05	2.08	4.30	3.65
Butralin at 2.0 L/fad.	23.00	22.81	8.89	7.93	2.20	1.60	4.40	2.80
Oxadiazon at 2.0 L/fad.	23.45	21.14	9.34	7.98	1.60	2.08	3.55	3.80
Metribuzin at 0.5 kg/fad.	19.03	15.61	5.78	5.91	0.83	0.85	2.70	1.65
Diphenamide at 1.5 kg/fad.	23.38	20.75	8.46	8.60	1.23	1.25	3.20	1.90
Tridex at 1.5 L/fad.	24.58	23.59	9.51	8.05	2.55	1.63	5.40	3.10
Phenisopham at 1.0 L/fad.	23.09	22.25	7.84	7.33	1.88	1.46	4.30	2.80
Linuron + Butralin Mix. *	24.56	22.00	9.94	7.61	2.23	1.73	4.50	3.55
Linuron + Oxadiazon	26.10	23.83	9.31	8.76	1.87	2.25	3.50	3.85
Linuron + Metribuzin	26.46	23.38	8.39	9.06	2.60	2.23	5.05	4.05
Linuron + Diphenamide	24.25	21.23	9.25	7.84	1.41	1.29	3.10	2.35
Linuron + Tridex	23.29	22.49	9.51	9.16	2.45	2.35	4.80	4.30
Linuron + Phenisophain	23.53	20.90	8.35	7.84	2.07	1.68	4.20	3.20
Hoeing	23.39	22.73	8.94	8.08	1.80	1.95	4.20	3.60
Control (un-weeded)	21.74	19.80	7.81	6.50	1.13	1.10	2.35	1.50
L.S.D. at 5% level	N.S		0.71		0.20		0.23	

* Mixture rates were half of those of the individual herbicide rates.

Table (7): Effect of the interaction of planting methods with some weed control treatments on some growth characters in sobyean crop after 60 days from sowing.
(Combined analysis of 1979 and 1980 experiments).

Methods of planting / Weed control treatments	Plant height in cms.		No. of leaves /plant		Dry weight of leaves/ plant in gms.		Dry weight of whole plant in gms.	
	Heraty	Afir	Heraty	Afir	Heraty	Afir	Heraty	Afir
Linuron at 1.0 kg/fad.	62.10	59.20	29.20	27.65	9.65	8.05	20.80	20.25
Butralin at 2.0 L/fad.	62.75	52.40	31.75	31.60	11.15	6.85	20.65	18.70
Oxadiazon at 2.0 L/fad.	61.50	60.50	22.00	26.85	8.15	8.10	16.85	18.85
Metribuzin at 0.5 kg/fad.	41.85	41.35	17.50	19.05	7.45	6.75	23.10	21.55
Diphenamide at 1.5 kg/fad.	54.95	48.65	28.05	24.75	7.00	6.45	15.70	15.85
Tridex at 1.5 L/fad.	65.50	55.55	31.25	31.10	13.25	5.65	21.90	18.40
Phenisopham at 1.0 L/fad.	58.85	52.00	24.40	22.70	8.20	8.00	17.30	15.75
Linuron + Butralin Mix. *	63.65	54.10	31.70	27.75	10.35	6.50	21.55	20.65
Linuron + Oxadiazon	59.35	60.50	27.50	28.50	8.10	9.70	16.70	19.55
Linuron + Metribuzin	66.50	63.85	35.50	36.75	13.20	9.75	24.10	22.00
Linuron + Diphenamide	56.00	47.80	24.75	22.95	7.65	5.95	16.15	16.35
Linuron + Tridex	67.10	63.15	35.74	30.10	12.15	10.75	22.85	22.25
Linuron + Phenisopham	60.25	52.15	27.15	24.40	9.20	7.35	19.80	19.35
Hoeing	61.20	58.45	28.00	27.35	11.35	7.40	19.70	20.60
Control	49.70	40.50	17.55	17.75	6.75	4.70	13.90	15.10
L.S.D. at 5% level	2.74		2.27		1.09		N.S	

* Mixture rates were half of those of the individual herbicide rates.

C- **Effect of interaction between planting methods and some weed control treatments on:**

1- **Dry weight of weeds:**

Dat presented in Table (5) showed that the effect of interaction on dry weight of broad-leaved weeds and grassy weeds at 45 and 90 days from sowing, was statistically significant. Butralin, tridex, linuron, oxadiozon and diphenamide treatments as well as the control treatment did not respond similarly under the two different methods of soybean planting. The effect of these treatments on the dry weight of broad-leaved weeds at the early stage of soybean plant was more pronounced in the case of heraty planting and differed significantly from that of afir method. Concerning the effect of this interaction on grassy weeds after 90 days from sowing, results in Table (5) indicate that the dry weight of grass weeds in all weed control treatments was lower in heraty method than in afir one, but the degree of superiority in heraty over afir in that respect differed from one weed control treatment to another.

2- **Growth of soybean plants:**

Results in Table (6 and 7) show the effect of the interaction between planting methods and weed control treatments on plant height, no. of leaves/plant, dry weight of leaves/plant and dry weight of whole plant after 40, and 60 days from sowing. The effect of this interaction was significant on all studied characters except plant height at 40 days stage and weight of the whole plant at 60 days from sowing. Meanwhile, the effect of this interaction was not statistically significant on all characters at 80 days from sowing. Weed control treatments were more effective on plant growth in most cases by using heraty method than afir. Data also demonstrate that the effect of studied treatments did not take the same trend at the different periods of soybean growth under heraty of afir method. With regard to growth after 40 days from planting, soybean plants were relatively vigorous in heraty than in afir method. The extent of this vigor differed from one treatment to another, it reached the level of significance in some treatments and did not reache it in others.

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تأثير طرق الزراعة وكفاءة المبيدات العشبية علي فول الصويا

(١) صفات النمو والحشائش المصاحبة

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علي عبد الهادى سالم

أجريت تجربتان حقليتان بمحطة البحوث التجارب الزراعية بكلية زراعة مشتهر جامعة الزقازيق في موسمي ١٩٧٩ ، ١٩٨٠ وذلك بغرض دراسة تأثير طريقتين لزراعة فول الصويا صنف كالاند (الحراثي والعفير) وبعض المبيدات العشبية هي لينيرون(١ كجم) ،بيوتر الين (٢ لتر) ،أكساديزون (٢ لتر) ،متريبوزين (٥ر كجم) ،ديفيناسيد (٥ر١ كجم) ،تريدكس (١ لتر) ،فينوسبوفام (١ لتر) ومخاليط المبيدات السابقة بنصف تركيزاتها مع اللينيرون علاوة علي معاملة العزيق (٣ مرات) ومعاملة الكنترول (بدون مقاومة).

وكانت أهم النتائج المتحصل عليها هي :

(١) تفوقت طريقة الزراعة الحراثي علي الطريقة العفير في مقاومة حشائش فول الصويا سواء العريضة أو الضيقة الأوراق .

(٢) أعطت طريقة الزراعة الحراثي زيادة معنوية في صفات : ارتفاع النبات ،عدد ووزن أوراق النبات والوزن الكلي للنبات وذلك بالمقارنة بالطريقة العفير .

(٣) تفوقت مخاليط المبيدات العشبية علي المبيدات المفردة في مقاومة الحشائش المصاحبة لفول الصويا وكذلك في صفات النمو التي تمت دراستها .

(٤) كان للتفاعل بين طرق الزراعة واستخدام المبيدات العشبية تأثيرا معنويا علي بعض صفات النمو مثل عدد ووزن أوراق النبات والوزن الكلي للنبات (عند عمر ٤٠ يوما) وكذلك عدد ووزن أوراق النبات (عند عمر ٦٠ يوما من الزراعة).