RESULTS AND DISCUSSION

Experiment I:

This study was carried out to investigate the effect of two cultural methods (Heraty and Afir) and some chemical weed control treatments on soybean crop and its associated weeds.

A. Effect of methods of planting:

The weeds of every plot were separated and classified into two classes namely, broad-leaved weeds and grass weeds. The prevailing weed during the growing seasons of soybean were as follows:

The broad-leaved weeds after 45 days from sowing (*Xanthium sp.* (Cocklebur), *Chenopodium sp.* (Lamb squarter), *Portulaca oleraceae* (Purslane), *Sonchus oleraceus* (Sowthistle), *Chichorium pumilum* (Wildchicory), *Rumex dentatus* (Sorrel), *Amaranthus* sp. (Pig weed), *Convolvulus arvensis* (Morning glory), while the dominant broad-leaved weeds at 90 days from sowing *Xanthium sp.*, *Portulaca oleraceae*, *Melilotus indicus* (stink clover), *convolvulus arvensis*, *Galinsoga parviflora* (gallant soldier), *Midicago hispida* (Hol. Bur clover), *Eaphorbia macalata* (spurge, spotted), Ammi majus (greeter ammi), *Chenopodium sp.* and *Solanum nigrum* (black night shade). On the other

hand, grass weeds after 45 days from sowing were: Echinochloe colonum (corn panic grass) Cynodon dactylon (bermuda grass) and Digitaria sp.(crab grass), while after 90 days from sowing grasses were, Cynodon daetylon, Dinebra retroflexa, Setaria sp. (foxtail) and Cyperus sp. (nut sedage).

The dry weight of weeds per unit area (m^2) could be used as arebiable index to its distribution.

1. Dry weight of weeds:

Results in table (2) demonstrate that the dry weight of weeds in the heraty planting was inferior to that of afir method of planting. Differences in dry weight of broad-leaved and grass weeds between heraty and afir methods were significant after 45 and 90 days from sowing. The results were expected where the heraty planting considered one of weed control method. In this method most of germinated weeds removed at the time of sowing soybean seeds. On the contrary in the afir method most seeds of weeds germinate at the same time beside the germination of soybean seeds.

2. Growth of soybean plant:

At the early stage of growth (40 days from sowing), results in Table (3) demonstrate the superiority of heraty over afir method in some growth characters, i.e. plant

Table (2): Effect of methods of planting on dry weight of weeds (gm/m^2) 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	5.68	13.33a	11.41a

Table (3): Effect of methods of planting 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 statietically significant at the 5% level.

height, number of leaves per plant, dry weight of leaves/ plant and dry weight of the whole plants. This superiority does not reach the significant level except in the case of dry weight of the whole plant. The superiority could be attributed to the effeciency of heraty method in weed control as previously discussed in Table (3). The dry weight of the whole plant in heraty method was significant by greater than that of afir at 40 days after sowing. After 60 days from sowing the results in Table (3) indicate that there were significant difference between heraty and afir methods in plant height and dry weight of leaves per plant, but differences in number of leaves/plant and dry weight of the whole plant were not great enough to reach the level of significance. With regard to the later stage of growth (80 days after sowing) data in Table (3) showed significant differences between heraty and afir 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. These results reveal the superiority of heraty planting and this superiority could be due to the removing of many of the growing weeds as well as improvment to the seed bed of soybean.

3. Seed yield per plant and some of its components:

The data presented in Table (4) showed significant differences between heraty and afir methods in number of pods per plant, weight of pods per plant and seed index, but differences in number of branches and seed yield per plant was not significant.

4. Seed yield, biological yield and number of plants per faddan:

Data in Table (5) indicate that the heraty method was the best in all characters studied, where the differences between it and the afir method were statistically significant, i.e. biological yield/faddan, number of plants per faddan and finally the seed yield/faddan. These increases might be due to the good effects of heraty method on the characters studied in Tables (4 and 5).

5. Protein and oil percentages in soybean seeds:

The data in Table (6) show no significant differences between the heraty and afir methods on the percentages of both protein and oil. These results indicate that the heraty method increased the protein and oil yield/faddan by 13.5 and 13.1% over the afir method but this increases did not reach the 5% level of significance.

Table (4): Effect of methods of planting on yield and its components per plant. (Combined analysis of 1979 and 1980 experiments).

Methods of planting	No. of branches /plant	No. of pods/ plant	Weight of pods /plant in gms	Seed index	Seed yield /plant in gms.
Heraty	3.86a	71.75a	50.14a	17.39a	18.51a
Afir	3.70a	63.59b	47.21b	16.61b	17.50a

Table (5): Effect of methods of planting on biological yield, number of plants and seed yield per faddan (combined analysis of 1979 and 1980 experiments).

Methods of planting	Biological yield/fad. in kgs.	No. of plant/ fad.	Seed yield/ fad. in kgs
Heraty	4532a	72726a	1353a
Afir	4046b	69512b	1190b

Table (6): Effect of methods of planting on protein and oil percentages in soybean seeds. (Combined analysis of 1979 and 1980 experiments).

Methods of planting	Protein %	Oil %	Protein yield/ fad. in kgs.	Oil yield/ fad. in kgs.
Heraty	36.68a	21.72a	496.24	298.32
Afir	36.73a	22.18a	436.90	263.83

Means for each character followed by the same alphabetical letter are not statistically significant at the 5% level.

It could be concluded with regard to the results demonstrated in Tables 1,2,3,4,5 and 6 that the heraty planting was much better than the afir method in decreasing the weed spectrum and increasing the growth and yield of soybean plants.

Effect of weed control treatments on:

a. Dry weight of weeds:

The data presented in Table (7) indicate clearly that all weed control treatments decreased significantly the dry weight of broad-leaved and grass weeds as compared 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-emergence application of linuron at the rate of 3.0 kg/ha was similar to mechanical and hand weeding; Salim (1978) found that using butralin at 1.0 L/fad. as pre-emergence in soybean was equal to hoeing in controlling weeds and Al-Marsafy (1982) indicated that the best weed control treatment was the hand hoeing as compared with all other weed control treatments. The available results also indicate that all linuron mixtures with other herbicides were superior in controlling weeds than the similar treatments of the single herbicides with the exception of metribuzin treatment on grass weeds at 45 days from sowing

Table (7): Effect of some weed control treatments on dry weight of weeds (gm/m^2) 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 rate were half of that of the individual herbicides rates.

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

gave a very good weed control at the early stage of growth. The controlling effect of these treatments on broad-leaved weeds were 80.2, 77.9 and 76.7%, respectively, compared with control (un-weeded treatment). Data also indicate that there were no significant effect between hoeing, phenisopham, linuron-diphenamide mixture and linuron alone at the early stage (45 days from sowing). The depression in dry weight of broad-leaved weeds by these treatments amounted to 68.1, 68.8, 64.9 and 64.5% of the control treatment, respectively. Similary, differences between linuron-butralin, tridex, phenisopham and hoeing were not significant.

All weed control treatments have the same effect on the broad-leaved weeds at the late stage (90 days from sowing) where differences between all treatments and un-weeded treatment were significant. Data in Table (7) indicate clearly that the metribuzin at 0.5 kg/fad. and its combination with linuron still the best treatments at the late stage, followed by the mixtures of linuron-tridex, phenisopham and oxadiazon. The depression in dry weight of broad-leaved weeds due to these treatments, respectively were 85.34, 80.9, 78.4, 74.5 and 72.4% with compared to control treatment. Also the results indicate clearly that, butralin at 2.0 L/fad., diphanamide at 1.5 kg/fad. and

oxadiazon at 2.0 L/fad. had the same effect and still the lowest treatments in controlling the broad-leaved weeds at 90 days from sowing.

Concerning the grassy weeds, results in Table (7) demonstrate that all weed control treatments depressed to different extents its dry weight with the exception of phenisopham at 1.0 L/fad. which failed to control the grasses at 45 days from sowing. With respect to the early stage, the data indicate that the best treatments were, metribuzin at 0.5 kg/fad., followed by the mixture of linuron-metribuzin and butralin at 2.0 L/fad. Differences between these three treatments were not significant and the depression of dry weight of grass weeds amounted to 81.1, 72.6 and 76.9%, respectively, as compared to un-weeded treatment. Also there were no significant differences between diphenamide, oxadiazon, linuron and linuron + diphenamide treatments, which depressed the dry weight of grass weeds by 57.1, 53.7, 52.2 and 48.7% respectively of the control treatment. On the contrary the present data indicate that phenisopham at 1.0 L/fad and its combination with linuron were the lowest treatments in controlling the grass weeds.

Data in Table (7) demonstrate that the effect of weed control treatments at 90 days from sowing were very

similar to that at 45 days from sowing. The highest depression in grassy weeds dry weight occurred with metribuzin at 0.5 kg/fad., butralin at 2.0 L/fad. followed by linuron-metribuzin mixture, tridex, linuron + butralin, linuron + tridex and oxadiazon and thus followed by hoeing treatments. These treatments decreased the dry weight of grass weeds by 72.41, 69.3, 64.7, 63.1, 60.1, 57.8, 57.3 and 56.0% of the control treatment, respectively. On the contrary the lowest depression in the dry weight of grass weeds at 90 days from sowing were obtained by applying phenisopham at the rate of 1.0 L/fad., the mixture of linuron with phenisopham or diphenamide, diphenamide at 1.5 kg/fad. and linuron at 1.0 kg/fad. This depression amounted to 31.64, 44.91, 46.38, 49.33 and 48.19% of the unweeded treatment, respectively. Similar results in soybean crops were early reported by Abernathy and Wax (1971), Eastin (1973), Bayer and Ferrant (1974), Butts, et al. (1974), Lowrence and Habetz (1976), Stripecke and Ross (1976), Sarpe et al. (1977), Glauninger, et al. (1979) and Freydier (1980), all reported that metribuzin was the most effective for broad-leaved weeds and grassy weeds and they considered metribuzin a good selective herbicide at the rate of 0.25 to 0.75 kg/ha in soybean crop. On the contrary, Schrader (1973), stated that grass weeds showed some resistance to metribuzin. Also some investigators

found that the combinations of metribuzin with dinitro-aniline herbicides were most effective for controlling both broad-leaved and grass weeds as shown in the review of literature. With respect to linuron, Kvitko (1967), Houser, et al. (1972), Eastin (1973), Losada (1974), Veselovskii and Sjuryatin (1974), Berengier and Malbrunot (1977), Abdel Raouf and Fayed (1978), Salim (1978) and Al-Marsafy (1982) all of them mentioned that linuron at rates from 1.0 - 3.0 kg/ha was a good herbicide for controlling broad-leaved weeds and some of grasses concerning butralin herbicide, Bush, et al. (1970), Roberts et al. (1972), Salim (1978), Berengier and Malbrunot (1977) and Freydier (1980), they found that this herbicide considered a good one for controlling weeds especially summer grasses and some of broad-leaved weeds in soybean fields. Concerning the oxadiazon Bullon and Rodriguez (1975), Dosio et al. (1976), Mathis and Oliver (1977), Madrid et al. (1978) and Somody, et al. (1978), they concluded that oxadiazon can be used in soybeans for control weeds (most annual grasses and little of broad-leaved weeds. As for tridex, Lavigne (1968), Harvey (1971), Bayer and Ferrent (1974), Gautam and Mani (1975), Seim and Tenning (1976), Wilson and Hines (1977), Zanin (1979) and Malkina and Shumakova (1980), all declared that trifluralin and its combinations

when incorporated as pre-emergence in soybean crops were the best for controlling weeds.

Generally, the following could be concluded from above mentioned results:

1. Metribuzin and its combination with linuron at the rates recorded in Table (7) were considered the best treatments for controlling both broad-leaved and grass weeds throughout the growing season.
2. The herbicidal combinations used in this study were more effective in controlling weeds than any single herbicide.
3. Linuron, tridex, phenisopham, mixture of linuron with butralin, tridex or phenisopham were abroximately similar to hand hoeing in controlling broad-leaved weeds.
4. Butralin, oxadiazon and diphenamide were the worset treatments in respect to the control of broad-leaved weeds.
5. Metribuzin, butralin, oxadiazon and tridex as well as their combinations with linuron were the best treatments for controlling grass weeds.
6. The poorest treatment in controlling grass weeds was phenisopham at 1.0 L/fad.
7. The ideal method for planting soybean was the heraty method, which depressed the dry weight of weeds and it can be considered as a method of weed control.

B. Some growth characters of soybean plant:

The data presented in Table (8) indicate clearly that all weed control treatments increased growth of soybean plant, i.e. plant height, number of leaves/plant, dry weight of leaves/plant and dry weight of the whole plant. These results were true at the different periods of growth of soybean plant with the exception of metribuzin treatment at 40 and 60 days from sowing which decreased significantly the plant height, number of leaves and dry weight of leaves/ plant.

Plant height:

At the early stage (40 days from sowing) the data show that mixtures of linuron with metribuzin or oxadiazon followed by tridex and linuron at 1.0 kg/fad. gave the highest plants. These treatments increased plant height by 19.7, 19.7, 15.9 and 14.9% of the control treatment, respectively, Results also showed no significant effect on plant height betwsen the following treatments, butralin, oxadiazon, diphenamide, phenisopham, the linuron-diphenamide mixture and hoeing treatment at 40 days from sowing. At 60 and 80 days from sowing the data indicate that the best treatments were, mixtures of linuron with tridex or metribuzin followed by tridex alone and linuron alone. These treatments gave the tallest plants. The increases

Table (8): 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 a	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	19.68 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	22.0 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	23.1 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 that of the individual herbicides rates.
Means for each character followed by the same alphabetical letters are not statistically significant at 5% level.

in plant height amounted to 44.4, 44.4, 34.2 and 34.3%, respectively, at 60 days from sowing and 44.8, 36.6, 39.6 and 28.9%, respectively, at 80 days from sowing. Data also indicate that metribuzin treatment gave shorter plants at 60 days from sowing as compared to the un-weeded treatment. Meanwhile, diphenamide, metribuzin and linuron-diphenamide mixture gave shorter plants at 80 days from sowing as compared to those of other weed control treatments. On the other hand there were no significant differences between hoeing, linuron, oxadiazon, tridex and mixtur mixtures of linuron with butralin or oxadiazon treatments on plant height at 60 days from sowing. These treatments increased the height of soybean plants by 32.6, 34.6, 35.3, 34.2, 30.4 and 32.9% of the control, respectively. these increases in plant height hold fairly true throughout the growing season and the tridex treatment was superior to the other treatments in that respect. Differences in plant height between butralin, phenisopham and linuron-phenisopham mixture were not significant at 60 and 80 days from sowing.

Number of leaves per plant:

The available data in Table (8) indicate that the highest number of leaves per plant were recorded with the

mixture of linuron-tridex treatment at 40, 60 and 80 days after sowing. On the contrary metribuzin at 0.5 kg/fad. gave the lowest number of leaves per plant at 40 and 60 days from sowing, meanwhile at 80 days from sowing the soybean plants recovered the growth. At 40 days from sowing there were no significant differences between the following treatments; butralin, oxadiazon, diphenamide, tridex, mixture of linuron with butralin, oxadiazon or metribuzin and hoeing on the number of leaves per plant. Phenisopham had no effect on the number of leaves per plant as compared with un-weeded treatments.

Dry weight of leaves per plant:

Results in Table (8) demonstrate that there were significant differences between all weed control treatments and the un-weeded one. This was true at the all stages of growth with the exception of diphenamide (1.5 kg/fad.) at 40 days from sowing. The best treatments at 40 and 60 days from sowing were the mixtures of linuron with metribuzin or tridex, but at the later stage (80 days from sowing) was the metribuzin as well as its combination with linuron. On the other hand, the worst treatment at 40 days from sowing was metribuzin (0.5 kg/fad.), but at 60 and 80 days, dphenamide (1.5 kg/fad.) was the worst one. At the early stage there were no significant

differences among linuron, butralin, dinuron + butralin, linuron + oxadiazon, linuron + phonisopham and hoeing treatments on the dry weight of leaves per plant, but at the late stage there were no significant differences among linuron, butralin, phenisopham, linuron + oxadiazon, linuron + diphenamide and hoeing treatments. These treatments increased the dry weight of leaves by 53.8, 43.0, 52.2, 58.5, 62.6 and 55.0%, respectively, as compared with un-weeded treatment.

Dry weight of whole plant:

The data presented in Table (8) show significant differences among all weed control treatments under investigation. Data also indicate that the best treatment in that 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% of the un-weeded treatments at 40, 60 and 80 days after sowing; respectively. On the contrary the worst weed control treatments were metribuzin (0.5 kg/fad.) after 40 days from sowing and diphenamide at 1.5 kg/fad. and its combination with linuron after 60 and 80 days from sowing. Results also show no significant differences among the following treatments at the early stage; butralin,

C. Seed yield per plant and some of its components:

Results in Table (9) demonstrate clearly that all weed control treatments increased to different extents the number of branches, number of pods, weight of pods and seed yield per plant as well as seed index with the exception of diphenamide effect (1.5 kg/fad.) on number of branches per plant. The data also indicate that metribuzin treatment (0.5 kg/fad.) and its combination with linuron as well as the mixture of linuron with tridex gave the highest increases in all studied characters, i.e. number of branches, number of pods, weight of pods and seed yield per plant. These treatments increased the number of branches by 144.5, 128.0 and 148.0%, number of pods per plant by 80.2, 78.2 and 73.9%, weight of pods per plant by 84.3, 76.7 and 67.2%, seed yield per plant by 96.5, 82.9 and 92.5% and seed index by 35.4, 35.1 and 34.5%, respectively, as compared with un-weeded treatment. On the other hand, the data show that diphenamide (1.5 kg/fad.) treatment gave the lowest number of branches, number of pods, weight of pods and seed index if compared with other treatments under investigation. These results are in harmony with regard to their weed control responses as shown in Table (7).

Table (9): Effect of some weed control treatments on number of branches, number of pods, weight of pods and seed yield per plant and seed index. (Combined analysis of 1979 and 1980 experiments).

Weed control treatments	No. of branches per plant	No. of pods pat plant	Weight of pods/plant in gm	Seed yield per plant in gm.	Weight of 100 seeds in gm.
Linuron at 1.0 kg/fad.	3.8c	69.2e	48.65ef	17.98fg	16.93d
Butralin at 2.0 L/fad.	3.4bc	70.9e	51.23fg	18.68g	17.65e
Oxadiazon at 2.0 L/fad.	3.3b	63.2cd	44.05bcd	14.23b	15.85c
Metribuzin at 0.5 kg/fad.	5.5e	80.9h	61.70i	23.15j	18.93g
Diphenamide at 1.5 kg/fad.	2.3a	59.6b	42.55bc	16.88de	15.35b
Tridex at 1.5 L/fad.	4.2cd	73.9f	51.23fg	18.65g	18.15f
Phenisopham at 1.0 L/fad.	3.2b	64.5d	45.73cde	17.40ef	15.95c
Linuron + Butralin Mix. *	4.6d	75.9fg	53.03g	19.73h	18.63g
Linuron + Oxadiazon	3.6bc	61.5bcd	45.68cde	16.63d	17.23d
Linuron + Metribuzin	5.1d	79.9h	59.15i	21.55i	18.88g
Linuron + Diphenamide	2.8b	63.6cd	42.45b	17.55ef	16.05c
Linuron + Tridex	5.6e	78.0gh	55.98h	22.68j	18.80g
Linuron + Phenisopham	3.4bc	60.8bc	46.78de	15.73c	15.63bc
Hoeing	3.8c	68.5e	48.48ef	17.50ef	17.08d
Control	2.3a	44.9a	33.48a	11.78a	13.98a

* Mixtures rate were half of that of the individual herbicides rate.
Means for each character followed by the same alphabetical letters were not statistically significant at the 5% level.

Results also show that there were no significant differences among butralin, oxadiazon, phenisopham, linuron-phenisopham, linuron-diphenamide and linuron-oxadiazon treatments on the number of branches per plant, but their effects differed significantly on the number of pods, weight of pods, seed index and seed yield per plant Table (9). Meanwhile there were no relevence among hoeing, linuron and linuron-oxadiazon mixture on the number of b branches and seed index and among hoeing, linuron, butralin and tridex on the weight of pods per plant.

Concerning the seed yield per plant, no significant differences were obtained among hoeing, linuron + diphenamide, phenisopham and linuron treatments. These last treatments increased the seed yield per plant by 48.6, 48.9, 47.7 and 52.6% of the un-weeded treatment, respectively. Similar results were early reported by many investigators; Saghir and Bhatti (1972) indicated that linuron as pre-emergence treatment increased the number of pods per plant. Also, Salim (1978) showed that butralin at 0.75 L/fad. increased seed yield per plant. Moreover, Sistachs et al. (1975) stated that trifluralin at 0.5 kg/ha increased the number of pods and seeds per plant.

D. Biological yield, number of plants and seed yield per faddan:

Results in Table (10) indicate clearly that all weed control treatments increased significantly biological yield. number of plants and seed yield per faddan except the metribuzin (0.5 kg/fad.) and the mixture of linuron with tridex treatments. These two treatments decreased significantly the number of plants per faddan by 29.4 and 6.1% of the control, respectively. These results reveal that theee herbicides decreased significantly the soybean stands. Similar results were early reported by Rafael, et al. (1976) and Rubin (1976). They showed that metribuzin caused injury and damage to soybean crops, Harvey (1973) stated that trifluralin reduced soybean plant growth and Davis and Habetz (1975) indicated that bladex at 2.5 lb/ac caused an acceptable level of injury to soybeans.

The available results also indicate that the highest seed yield per faddan were recorded with the linuron-metribuzin treatment. This treatment increased the seed yield by 170.5% of the un-weeded treatment. Also, the mixture of linuron with oxadiazon gave an increase in seed yield amounted to 153.8% of the un-weeded treatment. Linuron + phenisopham, linuron + butralin and linuron + tridex gave similar effects on seed yield per faddan and

Table (10): Effect of some weed control treatments on seed yield, biological yield and number of plants per faddan.
(Combined analysis of 1979 and 1980 experiments)

Weed control treatments	Biological yield kg/ fad.	No. of plants/ fad.	Seed Yield kg/fad.
Linuron at 1.0 kg/fad.	4600ef	79440i	1375.4ef
Butralin at 2.0 L/fad.	4138de	66350d	1297.7d
Oxadiazon at 2.0 L/fad.	4380e	83500j	1385.6f
Metribuzin at 0.5 kg/fad.	3460c	43450a	771.6b
Diphenamide at 1.5 kg/fad.	3412c	70850e	1158.0c
Tridex at 1.5 L/fad.	5100g	74400fg	1330.7d
Phenisopham at 1.0 L/fad.	3908d	78850hi	1341.4de
Linuron + Butralin Mix. *	5476h	76550g	1417.8fg
Linuron + Oxadiazon	4792f	79900i	1487.4h
Linuron + Metribuzin	3120b	72400ef	1585.1i
Linuron + Diphenamide	3870d	71300e	1171.1c
Linuron + Tridex	4534ef	57750b	1395.9fg
Linuron + Phenisopham	4598ef	78700h	1433.9g
Hoeing	4398e	71800ef	1330.4d
Control	2310a	61500c	586.1a

* Mixtures rate were half of that of the individual herbicide rates.
Means for each character followed by the same alphabetical letters were not statistically significant at 5% level.

increased it significantly by 144.7, 141.9 and 138.2% of the control treatment, respectively. Data also showed no significant differences were obtained between the following treatments, i.e. linuron, oxadiazon, linuron-butralin and linuron-tridex mixtures. Also, butralin, tridex, phenisopham and hoeing did not differ from each other. These results might be attributed to the effect of these weed control treatments on the depression of weeds and consequently the increases in the growth characters of soybean plants, namely number of branches, number of pods, weight of pods, seed yield per plant and seed index Table (9).

In this connection Kvitko (1969), Ramirez et al. (1970) Parachetti et al. (1972), Saghir and Bhatti (1972), Baranova, et al. (1975) and many other investigators indicated that linuron and its combinations at the recommended rates caused an increase in soybean yield. Overton et al. (1978) and Salim (1978), stated that butralin gave significant increases in seed yield of soybeans. Bullon and Rodriguez (1975), mentioned that oxadiazon at 1.0-1.5 kg/ha. gave yields inferior to that obtained from the hand-weeded treatment, while Madrid, et al. (1978) showed that oxadiazon at 1.0-5.0 kg/ha. injured the crop severly. Frans and Blythe (1975) indicated that metribuzin at 0.25 lb/ac. + fluchloralin

at 1.0 lb/ac. gave the highest yields of soybean seeds, while Mangeot et al. (1975) mentioned that metribuzin at 0,42-0.84 kg/ha increased soybean yields but higher rates of 1.68 kg/ha decreased yields, Giri Raj Singh (1976) demonstrated that metribuzin at 1.0 kg/ha increased soybean yields by 57% and many others also showed that metribuzin particulary at the lower rates caused an increase in seed yield of soybean, while some of them showed that there was a damage to the crop at rates higher than 0.5 kg/ha. Veselovskii, et al. (1977) stated that trifluralin at 2.0-2.5 kg/ha increased yields by 45-70% compared with no weeding treatment.

With regard to number of plants per faddan, results in Table (10) show that oxadiazon at 2.0 L/fad. was the best treatment and differed significantly if compared with all other treatments.

This result was followed by linuron, phenisopham and linuron + oxadiazon, these treatments gave number of plants more than un-weeded control by 35.8, 29.2, 28.2 and 29.9%, respectively. Hoeing, diphenamide, linuron-metribuzin and linuron-diphenamide mixtures did not differ significantly from each other, but differed significantly from the other treatments and gave number of plants per faddan

significant differences among the following treatments, linuron, linuron-oxadiazon, linuron-phenisopham and linuron-tridex mixtures treatments. These treatments increased the biological yield per faddan by 99.1, 107.4, 99.0 and 96.3%, respectively, of the un-weeded treatment. Results also show that there were no significant differences between hoeing and odadiazon and between butralin and mixture of linuron-diphenamide, although each of these four treatments increased the biological yield as compared with the un-weeded treatment. In this connection, Malyshev (1976), reported that linuron at 3.0 kg/ha resulted 1.64 t fresh fodder/ha compared with respective yields of 1.67 t/ ha with 2 hand weeding and 1.13 t/ha without weed control, Roshdy (1979), found that all weed control treatments studied increased the biological yield of soybean per unit area compared with that obtained from un-weeded treatment. He indicated also that butralin at 2.5 L/fad. increased straw yield/fad. by 35.5% compared with un-weeded treatment. On the contrary Marriage et al. (1978), showed that metribuzin at 1.12 kg/ha caused injury to soybean crops.

E. Protein and oil percentage in soybean seeds:

Results in Table (11) reveal clearly that some of weed control treatments under investigation increased both protein and oil percentage significantly, but other

treatments showed no effect. The increases in protein percentages amounted to 11.8, 11.5, 10.7, 10.6, 10.5, 8.1, 8.6, 5.3, 5.2 and 4.8% of the control treatment by the following treatments, respectively; linuron-butralin mixture, phenisopham, diphenamide, butralin, hoeing, linuron, mixture of linuron with tridex, metribuzin, tridexond linuron-phenisopham mixture. On the contrary the following treatments, linuron + diphenamide, linuron + oxadiazon and oxadiazon reduced insignificantly the protein percentage. The highest increases in protein percentage were recorded with linuron-butralin mixture, phenisopham, diphenamide and butralin. Similar increase in protein percentage were achieved with hoeing treatment which amounted 10.5% of the control treatment.

Data presented in Table (11) reveal that the effect of studied weed control treatments on oil percentages were similar to that of protein percentages with some exceptions. The following weed control treatments; linuron + metribuzin, hoeing, tridex, oxadiazon, metribuzin, linuron, linuron + oxadiazon and phenisopham increased to different extents the oil percentage as compared with the un-weeded treatment, while other weed control treatments did not differ in that respect from the control treatment.

Table (11): Effect of some weed control treatments on protein and oil percentage in soybean seeds. (Combined analysis of 1979 and 1980 experiments).

Weed control treatments	% protein	% oil	Protein yield /Fad. in kgs.	Oil yield/ Fad in kgs.
Linuron at 1.0 kg/fad.	37.68bc	21.88cde	518.24	300.93
Butralin at 2.0 L/fad.	38.55c	20.63abc	500.24	267.71
Oxadiazon at 2.0 L/fad.	34.13a	22.13de	472.90	306.63
Metribuzin at 0.5 kg/Fad.	36.71b	22.00cde	283.24	169.75
Diphenamide at 1.5 kg/fad.	38.57c	20.63abc	446.64	262.10
Tridex at 1.5 L/fad.	36.68b	22.38de	488.10	297.81
Phenisopham at 1.0 L/fad.	38.85c	21.13bcd	521.15	283.44
Linuron + Butralin Mix. *	38.97c	20.38ab	552.53	288.95
Linuron + Oxadiazin	33.82a	21.75cde	503.02	323.50
Linuron + Metribuzin	34.16a	22.88e	541.46	362.67
Linuron + Diphenamide	34.73a	20.38ab	406.72	238.67
Linuron + Tridex	37.85bc	21.00abc	528.34	293.13
Linuron + Phenisopham	36.53b	20.38ab	523.79	292.22
Hoeing	38.53c	22.63	512.61	301.10
Control	34.85a	19.68a	204.23	115.34

* Mixtures rate were half of that of the individual herbicide rates.
Means for each character followed by the same alphabetical letters were not statistically significant at the 5% level.

Results also demonstrate that most of the weed control treatments which increased the protein % over the un-weeded treatment did not show the same response on the oil % and the opposite hold fairly true. These treatments were; linuron + butralin, butralin, diphenamide and the mixtures of linuron-tridex or linuron-phenisopham. Meanwhile the effect of linuron-diphenamide treatment on both protein and oil percentages were the same and did not differ from the control treatments. The available data indicate clearly that hoeing treatment increased both protein and oil percentages by 10.5 and 14.9% of the control treatment, respectively.

Concerning both protein yield and oil yield per faddan, data in Table (11) indicate that all weed control treatments increased to a great extent the protein and oil yield per faddan. These increases amounted to the double amount of the un-weeded on the highest protein yield per faddan were obtained by the following treatments linuron-butralin, linuron-metribuzin mixtures, phenisopham and hoeing. The increases in protein yield due to these treatments amounted to 170.5, 165.1, 155.1 and 150.9% of the control treatments, respectively. Meanwhile the following treatments; linuron + metribuzin, linuron + oxadiazon, oxadiazon and hoeing gave highest oil yield

per faddan. Their increases amounted to 214.4, 180.4, 165.8 and 161.0% of the control treatment, respectively.

Similar results were early reported by Penner and Meggitt (1970), indicated that trifluralin at the rates of 0.75-1.0 lb/ac had no effect on the tottal oil content of soybean, Saghir and Bhatti (1972), found that linuron at 0.5-1.0 kg/ha increased protein and oil yields of soybeans and improved oil quality. Also Singh and Mani (1975), showed that trifluralin (2.0 L) + vernam (1.0 L)/ ha increased the protein yield by 4 h kg/ha compared with un-weeded control. On the other hand Melyshev (1976), concluded that trifluralin or linuron at 2.0-3.0 kg/ha reduced protein content of soybean seeds by 0.1-2.0% and oil by 1.2-3.5%, but increased the total yields of protein and oil and finally Venturella et al. (1976), found that trifluralin, linuron, metribuzin and vernolate applied single or in combinations had no effect on protein and oil contents of soybean seeds.

Effect of the interaction between methods of planting and some weed control treatments on:

1. Dry weight of weeds:

The data presented in Table (12) demonstrate the effect of the above interaction on the dry weight of weeds. The effect of this interaction on dry weight of weeds. The effect of this interaction on dry weight of grass weeds at 45 days from sowing and broad-leaved weeds at 90 days from sowing were not statistically significant, while its effect on dry weight of broad-leaved weeds and grassy weeds at 45 and 90 days from sowing, respectively, was statistically significant. This indicate that the studied weed control treatments do not behave similarly under the different methods of planting. However, the dry weight of both broad-leaved and grassy weeds per unit area was greater in afir method than heraty method for all weed control treatments. These results were true after 45 and 90 days from sowing.

With regard to the dry weight of broad-leaved weeds at 45 days from sowing the data indicate that treatments of metribuzin alone as well as its combination with linuron were the best treatments for controlling broad-leaved weeds at the early stage of soybean plant by using heraty or afir methods. Moreover, results also indicate that all mixtures of linuron with tridex, butralin,

Tabls (12): Effect of the interaction of methods of planting with some weed control treatments on dry weight of weeds (gm/m^2) after 45 and 90 days from sowing of soybean crop.
(Combined analysis of 1979 and 1980 experiments).

Methode 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
Batralin 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	

* Mixtures rate were half of that of the individual herbicides rates.

metribuzin, diphenamide, oxadiazon and phenisopham gave a good or satisfactory control for broad-leaved weeds and did not differ significantly with the method of planting. Similar responses were obtained with phenisopham and hoeing treatments. On the other hand, butralin, tridex, linuron, oxadiozon and diphenamide treatments as well as the control treatment do 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 differ significantly from that of afir planting. Concerning the effect of this interaction on grassy weeds after 90 days from sowing, results in Table (12) indicate that the dry weight of grass weeds in all weed control treatments were lower in heraty method than in afir method, but the degree of superiority in heraty over afir in that respect differ from weed control treatment to another. The best treatments in both methods of planting were metribuzin and butralin. They gave the lowest dry weight of grasses in spite of the significant differences between heraty and afir in that respect. Data also show that all weed control treatments with two exceptions (i.e. mixtures of linuron with oxadiazon or with metribuzin) were more effective in

controlling grasses under heraty method. Their effect on the dry weight of grassy weeds statistically lower than that of afir method at 90 days from sowing. Meanwhile, there were no significant differences between the two methods of planting on the dry weight of grassy weeds under the mixtures of linuron with either oxadiazon or metribuzin (Table 12). The worst treatments in controlling grass weeds at the late stage of soybean growth in both methods of planting were diphenamide and phenisopham and their combination with linuron.

2. Growth of soybean plants:

Results in Table (13, 14 and 15) show the effect of the interaction between methods of planting and weed control treatments on plant height, number of leaves per plant, dry weight of leaves per plant and dry weight of whole plant after 40, 60 and 80 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. Meahwhile, the effect of this interaction was not statistically significant on all characters at 80 days from sowing.

Data indicate that weed control treatments were more effective on plant growth in most cases by using heraty

Table (13): Effect of the interaction of methods of planting with some weed control treatments on some growth characters in soybean crop after 40 days from sowing.
(Combined anelysis of 1979 and 1980 experiments).

Methods of planting / Weed control treatments	Plant height in cms.		No. of leaves plant.		Dry weight/ plant of leaves in gms		Dry weight of whole plant in gms	
	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	

* Mixturee rate were half of that of the individual herbicide rates.

Table (14): Effect of the interaction of methods of planting with some weed control treatments on some growth characters in soybean crop after 60 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.	
Weed control treatments	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	

* Mixtures rate were half of that of the individual herbicide rates.

Table (15): Effect of the interaction of methods of planting with some weed control treatments on some growth characters in soybean crops after 80 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.	75.40	74.20	36.95	34.25	15.95	13.50	37.10	93.65
Butralin at 2.0 L/fad.	78.75	76.80	34.20	31.35	14.40	13.00	36.35	35.95
Oxadiazon at 2.0 L/fad.	72.95	74.40	33.90	30.35	14.05	11.75	32.50	29.50
Metribuzin at 0.5 kg/fad.	69.75	67.10	41.25	38.90	21.35	20.00	46.50	43.25
Diphenamide at 1.5 kg/fad.	67.75	65.60	32.20	29.35	12.85	10.40	27.90	27.65
Tridex at 1.5 L/fad.	83.15	78.85	37.60	33.15	17.95	16.00	41.80	40.15
Phenisopham at 1.0 L/fad.	77.20	74.75	38.70	35.20	15.30	13.85	32.95	29.40
Linuron + Butralin Mix.*	79.20	75.25	38.95	36.10	18.35	16.05	37.60	35.30
Linuron + Oxadiazon	74.35	70.50	36.80	33.40	15.90	14.45	34.40	33.60
Linuron + Metribuzin	81.40	77.15	44.90	40.20	21.30	18.45	46.75	43.35
Linuron + Diphenamide	69.95	66.55	36.60	36.70	15.80	15.35	29.60	25.75
Linuron + Tridex	84.40	83.60	41.20	41.60	19.50	17.50	43.30	39.15
Linuron + Phenisophamat	74.35	75.35	40.95	39.15	18.70	16.30	35.20	30.45
Hoeing	74.75	70.65	36.55	32.80	16.10	13.60	37.50	33.70
Control (unweeded)	59.75	56.30	28.10	25.10	10.10	9.05	24.00	20.50
L.S.D. at 5% level	N.S		N.S		N.S		N.S	

* Mixtures rate were half of that of the individual herbicide rates.

planting than afir planting. Data also demonstrate that the effect of studied treatments did not take the same trend at the different period of growth of soybean plant under heraty or afir planting. With regard to growth after 40 days from sowing, data in Table (13) show that soybean plants were relatively vigorous in heraty than afir method. The extent of this vigorsty differed from one treatment to another, it reached the level of significance in some treatments and did not reached it in others.

Results in Table (13) indicate that tridex treatments were among the best treatments, but plant response to tridex alone under heraty and afir methods differ than that in case of linuron-tridex mixture. The response of plant growth to tridex was superior under heraty method, but this superiority disappeared in case of tridex-linuron mixture Table (13).

As for the moderate time (after 60 days from sowing), data in Table (14) show that there were statistically significant effects on all studied plant characters with the exception of dry weight of whole plant. The best treatments which gave the tallest plants in both methods of planting were butralin and tridex and their combinations with linuron and linuron-metribuzin mixture. On

the other hand the lowest height was obtained by both diphenamide and metribuzin in heraty as well as in afir. The same above treatments gave same trend in both of number of leaves and dry weight of leaves per plant. Finally, the best treatment which gave the highest dry weight of whole plant were, metribuzin, tridex and their combinations with linuron under the two methods of planting.

3. Yield and its components:

The results in Tables (16 and 17) show that the effect of the interaction between methods of planting and weed control treatments on, number of branches, number of pods, weight of pods and seed yield per plant, also show the seed index, biological yield, number of plants and seed yield per feddan. All the above characters were statistically significant with the exception of both number of pods and weight of pods per plant were not significant. With regard to seed yield per plant in gms data in Table (16) show that metribuzin at 0.5 kg/fad. gave the highest seed yield per plant under the two methods of planting, these results due to the true that this herbicide depressed the number of plant in unit area. Also this treatment gave high number of pods and weight of pods per plant. The data show that linuron and its combinations with tridex, butralin, oxadiazon and hoeing treatments were good in

Table (16): Effect of the interaction of methods of planting with some weed control treatments on yield and its component per plant in soybean crop. (combined analysis of 1979 and 1980 experiments)

Methods of planting / Weed control treatments	No. of branches per plant		No. of pods per plant		Weight of per plant in gms		Seed yield per plant in gms	
	Heraty	Afir	Heraty	Afir	Heraty	Afir	Heraty	Afir
Linuron at 1.0 kg/fad.	3.70	3.95	73.60	64.75	50.65	46.65	18.15	17.80
Butralin at 2.0 L/fad.	3.75	3.10	74.70	67.00	52.60	49.85	19.25	18.10
Oxadiazon at 2.0 L/fad.	3.40	3.15	67.15	59.25	44.60	43.50	14.60	13.85
Metribuzin at 0.5 kg/fad.	5.70	5.30	86.15	75.60	62.80	60.60	22.55	23.75
Diphenamide at 1.5 kg	1.95	2.55	63.40	55.70	42.75	42.35	18.00	15.75
Tridex at 1.5 L/fad.	4.25	4.05	77.00	70.70	50.50	51.95	19.35	17.95
Phenisopham at 1.0 L/fad.	3.30	3.15	71.75	57.15	47.65	43.80	18.15	16.65
Linuron + Butralin Mix.*	4.80	4.35	79.00	72.85	55.25	50.80	19.95	19.50
Linuron + Oxadiazon	3.65	3.45	67.05	55.95	48.80	42.55	18.15	15.10
Lin + Metribuzin	5.25	5.00	83.85	76.10	59.55	58.75	21.25	21.85
Linuron + Diphenamide	3.05	2.55	66.10	61.10	46.40	38.50	18.15	16.95
Linuron + Tridex	5.55	5.60	81.25	74.80	56.90	55.05	22.80	22.55
Linuron + Phenisopham	3.65	3.05	64.10	57.50	47.65	45.90	16.65	14.80
Hoeing	3.75	3.85	71.95	64.95	49.80	47.15	18.00	17.00
Control (un-weeded)	2.10	2.40	49.25	40.50	36.15	30.80	12.65	10.90
L.S.D. at 5% level	0.37		N.S		N.S		0.79	

* Mixtures rate were half of that of the individual herbicide rates.

Table (18): Effect of the interaction of methods of planting with some weed control treatments on protein and oil percentage in soybean seeds.
(Combined analysis of 1979 and 1980 experiments).

Method of planting / Weed control treatments	% protein		% oil	
	Heraty	Afir	Heraty	Afir
Linuron at 1.0 kg/fad.	37.63	37.71	21.00	22.75
Butralin at 2.0 L/fad.	38.56	38.53	18.75	22.50
Oxadiazon at 2.0 L/fad.	34.33	33.94	21.50	22.75
Metribuzin at 0.5 kg/fad.	36.40	37.02	20.50	23.50
Diphenamide at 1.5 kg/fad	38.47	38.68	21.50	23.75
Tridex at 1.5 L/fad.	36.93	36.43	21.75	23.00
Phenisopham at 1.0 L/fad.	39.20	38.51	18.75	23.50
Linuron + Butralin Mix.*	38.95	39.03	20.25	20.50
Linuron + Oxadiazon	33.90	33.75	21.50	22.00
Linuron + Metribuzin	33.90	34.42	23.00	22.75
Linuron + Diphenamide	34.80	34.68	19.75	21.00
Linuron + Tridex	37.86	37.83	20.00	22.00
Linuron + Phenisopham	36.17	36.90	20.50	20.25
Hoeing	38.62	38.44	22.75	22.50
Control (un-weeded)	34.53	35.17	19.35	20.00
L.S.D. at 5% level	N.S.		N.S.	

* Mixtures rate were half of that of the individual herbicide rates.

Effect of the interaction between methods of planting and years:

Results in table (19) show significant effects of years with methods of planting interaction on the following characters; dry weight of broad-leaved weeds after 45 days from sowing, dry weight of grass weeds after 45 and 90 days from sowing, plant height after 40, 60 and 80 days from sowing, number of leaves per plant after 40 and 60 days from sowing, dry weight of leaves per plant after 40 and 60 days from sowing, dry weight of whole plant after 40 days from sowing, number of pods per plant, number of plants per faddan, biological yield per faddan and seed yield per faddan. These significant effects reveal that the two methods of planting did not behave the same throughout the two growing seasons.

1. Dry weight of weeds:

Data presented in Table (20) indicate that methods of planting did not behave similary in 1979 and 1980 growing seasons. The available results show clearly that the heraty method depressed the dry weight of both grasses and broad-leaved weeds at the stages of growth but the depression effect was more pronounced in the first growing seasons. The superiority of heraty over afir method in depressing the dry weight of weeds after 45 days from

Table (19): Effect of the interaction between years and methods of planting on the following characters:

Characters	Days after sowing	
	45	90
Dry weight of broad-leaved weeds (gm/m^2)	S.	N.S
Dry weight of grass weeds (gm/m^2)	S.	S.

	40	60	80
Plant height	S.	S.	S.
Number of leaves per plant	S.	S.	N.S.
Dry weight of leaves per plant	S.	S.	N.S.
Dry weight of the whole plant	S.	N.S.	N.S.

	At harvest
Number of branches per plant	N.S.
Number of pods per plant	S.
Weight of pods per plant in gm.	N.S.
Seed yield perjplant in gm.	N.S.
Weight of 100 seeds in gm.	N.S.
Number of plants per faddan.	S.
Biological yield per faddan in kg.	S.
Seed yield per faddan in kg.	S.
Seed oil percentage	N.S.
Seed protein percentage	N.S.

Table (20): Effect of the interaction between methods of planting and years on dry weight of broad-leaved and grass weeds after 45 and 90 days from sowing.

Years	Methods of planting	45 days after sowing		90 days after sowing
		Broad-leaved weeds	Grass weeds	Grass weeds
1979	Heraty	10.9a	5.3b	9.4b
	Afir	14.2c	7.5c	13.3c
1980	Heraty	9.9a	3.1a	7.9a
	Afir	11.2b	3.9a	9.5b

Table (21): Effect of the interaction between methods of planting and years on plant height of soybean plant.

Years	Methods of planting	Days after sowing		
		40	60	80
1979	Heraty	24.99b	60.11b	71.51a
	Afir	21.81a	57.29b	70.06a
1980	Heraty	22.31ab	58.72b	78.23b
	Afir	21.58a	50.73a	74.88b

Table (22): Effect of the interaction between methods of planting and years on number of leaves and dry weight of leaves per plant of soybean plant.

Years	Methods of planting	Days after sowing			
		40		60	
		No. of leaves/ plant	Dry weight of leaves per plant	No. of leaves/ plant	Dry weight of leaves per plant
1979	Heraty	8.37ab	1.25a	28.12c	9.99b
	Afir	8.19a	1.21a	28.39c	8.47ab
1980	Heraty	8.90b	2.46b	26.83b	9.15b
	Afir	7.61a	2.19ab	24.85a	6.45a

Table (23): Effect of the interaction between methods of planting and years on dry weight of the whole plant of soybean plant.

Years	Methods of planting	40 days after sowing
1979	Heraty	3.89ab
	Afir	3.16a
1980	Heraty	4.05b
	Afir	2.99a

were true at 40 and 60 days from sowing.

Regarding to the effect of the same interaction on the dry weight of the whole plant, it is clear from the data tabulated in Table (23) that there was no significant differences between two methods of planting in the 1979 year but was significant in the 1980 year.

3. Yield and its components:

Table (24) show that the effect of the interaction between methods of planting and years were statistically significant on number of pods per plant, number of plants per faddan, biological yield and seed yield per faddan. These significant differences reveal different responses of methods of planting in the two years of study. The available data demonstrate the superiority of heraty over afir for all studied characters in the two years of study. This superiority in number of pods per plants, number of plants per faddan, biological yield as well as seed yield per faddan were more pronounced in the 1980 year.

Effect of the interaction between weed control treatments and years on soybean plants characters:

The effect of the interaction between years and weed control treatments was statistically significant on all characters presented in Table (25) with few exceptions,

Table (24): Effect of the interaction between methods of planting and years on yield and its components of soybean at harvest.

Years	Methods of planting	No. of pods/ plant	No. of plants/ faddan	Biolo-gical yield/ fad. in kgs.	Seed yield/ fad. in kgs.
1979	Heraty	66.92b	69054b	3724b	1154.2b
	Afir	61.18a	66826a	3416a	1024.7c
1980	Heraty	76.59c	76400d	5342d	1551.6d
	Afir	66.01b	72200c	4678c	1354.3c

Table (25): Effect of the interaction between weed control treatments and years on characters studied.

Characters	Days after sowing		
	45		90
Dry weight of broad-leaved weeds (gm/m^2)	S.		S.
Dry weight of grass weeds (gm/m^2)	S.		S.
	40	60	80
Plant height	S.	S.	S.
Number of leaves per plant	S.	S.	S.
Dry weight of leaves per plant in gm.	S.	S.	S.
Dry weight of the whole plant in gm.	S.	N.S	S.
	At harvest		
Number of branches per plant	S.		
Number of pods per plant	S.		
Weight of pods per plant in gm.	S.		
Seed yield per plant in gm.	S.		
Seed index	S.		
Number of plants per faddan	S.		
Biological yield per faddan in kg.	S.		
Seed yield per faddan in kg.	S.		
Seed oil percentage	N.S.		
Seed protein percentage	N.S.		

i.e. dry weight of the whole plant at 60 days from sowing and seed oil and protein percentages.

1. Dry weight of weeds:

Data presented in Table (26) show that the weed control treatments did not behave the same similary in the 1979 and 1980 years. The available results show clearly that the response of dry weight of weeds differed by using herbicides. These results may be due to the difference in soil and the flora throughout the two growing seasons.

2. Growth of soybean plant:

Results in Tables 27-29 show the significant effect of the previous interaction namely weed control treatments x years. The available data indicate that the effect of the weed control treatments did not behave the same trend in the 1979 and 1980 seasons on the all studied characters except the dry weight of plant height at 60 days from sowing.

3. Yield and its components:

The effect of this interaction on the number of branches, number of pods, weight of pods, seed yield per plant, weight of pods per plant, seed yield per plant, seed index, number of plants per faddan, biological yield and seed yield per faddan were statistically significant Tables 30 and 31. These significant differences reveal different

Table (26): Effect of the interaction of weed control treatments with years on dry weight of weeds (gm/m^2) after 45 and 90 days from sowing.

Weed control treatments	After 45 days from sowing				After 90 days from sowing			
	Broad-leaved		Grasses		Broad-leaved		Grasses	
	1979	1980	1979	1980	1979	1980	1979	1980
Linuron at 1.0 kg/fad.	14.43	9.63	6.95	3.60	9.20	11.11	12.64	9.19
Butralin at 2.0 L/fad.	19.18	12.79	2.84	2.46	15.94	13.39	6.63	6.27
Oxadiazon at 2.0 L/fad.	14.30	13.81	7.95	2.26	11.40	16.46	10.73	7.21
Metribazin at 0.5 kg/fad.	5.51	4.15	2.03	2.17	4.05	6.04	5.69	5.91
Diphenamid at 1.5 kg/fad.	15.35	13.89	5.93	3.56	11.28	17.17	10.63	10.94
Tridex at 1.5 L/fad.	11.05	8.34	4.88	3.46	8.94	10.61	9.00	6.52
Phenisopham at 1.0 L/fad.	11.37	9.76	9.16	4.69	10.41	13.10	18.63	10.09
Linuron + Butralin Mix.*	8.96	9.39	5.73	2.63	11.95	13.07	9.77	6.95
Linuron + Oxadiazon	7.34	8.48	8.33	2.21	7.61	11.29	9.75	5.86
Linuron + Metribazin	3.84	3.46	3.35	2.70	5.83	7.23	7.10	7.74
Linuron + Diphenamid	11.67	12.15	6.87	4.46	10.33	14.34	10.83	11.71
Linuron + Tridex	7.32	6.07	4.70	2.34	7.60	7.17	10.00	7.78
Linuron + Phenisopham	7.50	7.47	8.65	4.10	9.20	8.22	12.80	10.35
Hoeing	12.16	9.49	5.68	2.59	10.95	12.38	11.58	6.92
Control	37.88	29.91	13.15	8.93	30.50	37.90	24.75	17.30
L.S.D. at 5%	1.75		0.91		1.93		1.45	
1%	2.31		1.21		2.54		1.92	

* Mixtures rate were half of that of the individual herbicides rate.

Table (27): Effect of the interaction of weed control treatments with years on some growth characters of soybean plant after 40 days from sowing.

Weed control treatments	Plant height height in cm.		No. of leaves leaves/plant		Dry weight of leaves/ plant in gm.		Dry weight of whole plant in gm.	
	1979	1980	1979	1980	1979	1980	1979	1980
Linuron at 1.0 kg/fad.	23.95	23.89	7.80	8.20	1.38	2.75	3.85	4.10
Butralin at 2.0 L/fad.	24.60	21.21	8.70	8.11	1.20	2.60	3.45	3.75
Oxadiazon at 2.0 L/fad.	24.15	20.44	9.24	8.08	1.28	2.40	3.60	3.75
Metribuzin at 0.5 kg/fad.	17.20	17.44	5.64	6.05	0.48	1.20	2.30	2.05
Diphenamide at 1.5 kg/fad.	22.15	21.98	8.85	8.21	1.08	1.40	2.70	2.40
Tridex at 1.5 L/fad.	25.35	22.81	8.40	9.16	1.33	2.85	4.40	4.10
Phenisopham at 1.0 L/fad.	25.05	20.29	7.48	7.69	1.24	2.10	3.90	3.20
Linuron + Butralin Mix.*	24.75	21.81	8.20	9.35	1.30	2.65	4.05	4.00
Linuron + Oxadiazon	25.90	24.03	9.10	8.98	1.47	2.65	3.15	4.20
Linuron + Metribuzin	24.60	25.24	8.95	8.50	1.48	3.35	4.40	4.70
Linuron + Diphenamide	21.10	24.38	7.78	9.31	1.15	1.55	2.85	2.60
Linuron + Tridex	24.00	21.78	10.15	8.53	1.40	3.40	4.40	4.70
Linuron + Phenisopham	23.35	21.08	7.95	8.24	1.29	2.45	3.65	3.75
Hoeing	23.40	22.71	8.30	8.71	1.25	2.50	4.05	3.75
Control	21.50	20.08	7.60	6.71	1.18	1.05	2.10	1.75
L.S.D. at 5%	1.38		0.60		0.16		0.20	
1%	1.82		0.80		0.22		0.25	

* Mixture rates were half of that of the individual herbicides rates.

Table (28): Effect of the interaction of weed control treatments with years on some growth characters of soybean plant after 60 days from sowing.

Weed control treatments	Plant height in cms		No. of leaves per plant		Dry weight of leaves/plant in gm	
	1979	1980	1979	1980	1979	1980
Linuron at 1.0 kg/fad.	62.30	59.00	27.85	29.00	10.05	7.65
Butralin at 2.0 L/fad.	58.85	56.30	32.10	31.25	9.75	8.25
Oxadiazon at 2.0 L/fad.	64.50	57.50	24.25	24.60	8.30	7.95
Metribuzin at 0.5 kg/fad.	40.55	42.65	19.55	17.10	9.55	4.65
Diphenamide 1.5 kg/fad.	57.90	45.70	33.20	19.60	7.85	5.60
Tridex at 1.5 L/fad.	63.15	57.90	30.90	31.45	8.45	10.45
Phenisopham at 1.0 L/fad.	59.75	51.10	25.60	21.50	10.20	6.00
Linuron + Butralin Mix. *	59.75	58.00	32.85	26.60	9.35	7.50
Linuron + oxadiazon	60.20	59.65	26.75	29.25	9.70	8.10
Linuron + Metribuzin	64.85	65.50	34.95	37.30	11.60	11.35
Linuron + Diphenamide	56.40	47.40	26.65	21.05	8.15	5.45
Linuron + Tridex	64.00	66.25	31.30	34.50	11.10	11.80
Linuron + Phenisopham	56.90	55.50	26.80	24.75	9.10	7.45
Hoeing	60.80	58.85	28.50	26.85	9.15	9.60
Control	50.60	39.60	22.55	12.75	6.20	5.25
L.S.D. at 5%	2.29		2.15		0.77	
1%	3.02		2.83		1.02	

* Mixtures rates were half of that of the individual herbicides rates.

Table (29): Effect of the interaction of weed control treatments with years on some growth characters of soybean plant after 80 days from sowing.

Weed control treatments	Plant height in cms.		No. of leaves per plant		Dry weight of leaves/ plant in gm		Dry weight of whole plant in gm.	
	1979	1980	1979	1980	1979	1980	1979	1980
Linuron at 1.0 kg/fad.	68.80	80.80	32.85	38.35	12.60	16.85	31.10	39.65
Butralin at 2.0 L/fad.	71.15	84.40	28.95	36.60	9.80	17.60	30.45	41.85
Oxadiazon at 2.0 L/fad.	71.65	75.70	32.10	32.15	11.95	13.85	32.90	29.10
Metribuzin at 0.5 kg/fad.	76.35	60.50	39.65	40.50	19.90	21.45	39.75	50.00
Diphenamide at 1.5 kg/fad.	64.25	69.10	31.25	30.30	11.50	11.75	28.35	27.20
Tridex at 1.5 L/fad.	72.65	89.35	35.15	35.60	15.30	18.65	36.05	45.90
Phenisopham at 1.0 L/fad.	75.35	76.60	33.55	40.35	13.60	15.55	28.30	34.05
Linuron + Butralin Mix. *	73.80	80.65	36.60	38.45	16.70	17.70	32.05	40.85
Linuron + Oxadiazon	71.90	72.95	35.10	35.10	14.40	15.95	36.20	31.80
Linuron + Metribuzin	70.80	87.75	41.85	43.25	20.85	18.90	42.00	48.10
Linuron + Diphenamide	66.85	69.65	33.75	39.50	13.85	17.30	27.25	28.10
Linuron + Tridex	81.35	86.65	37.30	45.50	16.75	20.25	38.70	43.75
Linuron + Phenisopham	68.85	80.85	40.25	39.85	20.70	14.30	31.55	34.10
Hoeing	69.00	76.40	35.10	34.25	14.10	15.60	33.20	38.00
Control	59.05	57.00	27.75	25.45	8.40	10.75	23.90	20.60
L.S.D. at 5%	2.20		2.29		1.83		2.27	
1%	2.91		3.02		2.41		3.00	

* Mixtures rates were half of that of the individual herbicides rates.

Table ( ): Effect of interaction of weed control treatments with years on yield and its components per plant at harvest.

Weed control treatments	No. of branches / plant		No. of pods/ plant		Weight of pods/plant in gm		Seed yield/ plant in gm	
	1979	1980	1979	1980	1979	1980	1979	1980
Linuron at 1.0 kg/fad.	3.40	4.25	64.70	73.65	44.05	53.25	15.85	20.10
Butralin at 2.0 L/fad.	3.60	3.25	67.10	74.60	45.15	57.30	15.95	21.40
Oxadiazon at 2.0 L/fad.	3.30	3.25	59.50	66.90	39.70	48.40	13.75	14.70
Metribuzin at 0.5 kg/fad.	4.60	6.40	72.65	89.10	51.50	71.90	19.50	26.80
Diphenamide at 1.5 kg/fad.	2.00	2.50	57.85	61.25	40.75	44.35	15.65	18.10
Tridex at 1.5 L/fad.	3.40	4.90	69.90	77.80	50.90	51.55	16.15	21.15
Phenisopham at 1.0 L/fad.	2.80	3.65	67.00	61.90	48.70	42.75	15.05	19.75
Linuron + Butralin Mix. *	4.85	4.30	69.35	82.50	52.00	54.05	17.35	22.10
Linuron + Oxadiazon	3.25	3.85	58.40	64.60	41.45	49.90	15.00	18.25
Linuron + Metribuzin	4.40	5.85	71.60	88.35	54.25	64.05	20.30	22.80
Linuron + Diphenamide	2.50	3.10	60.70	66.50	37.50	47.40	17.10	18.00
Linuron + Tridex	5.10	6.05	71.25	84.80	51.05	60.90	21.00	24.35
Linuron + Phenisopham	2.75	3.95	57.85	63.75	41.70	51.85	14.85	16.60
Hoeing	3.15	4.45	64.80	72.10	43.25	53.70	16.05	18.95
Control	2.60	1.90	48.10	41.65	31.65	35.30	10.60	12.95
L.S.D. at 5%	0.31		2.31		2.91		0.66	
1%	0.41		3.71		3.84		0.87	

* Mixture rates were half of that of the individual herbicides rates.

Teble (31): Effect of the interaction of weed control treatments with years on yield and its components per faddan.

Weed control treatments	Weight of 100 seeds in gm		No. of plants per faddan		Biological yield/fad. in kg		Seed yield/ fad. in kg.	
	1979	1980	1979	1980	1979	1980	1979	1980
Linuron at 1.0 kg/fad.	16.25	17.60	70600	88200	3600	5600	1135.5	1615.4
Butralin at 2.C L/fad.	17.80	17.00	62600	70000	3410	4866	1002.8	1592.5
Oxadiazon at 2.0 L/fad.	15.15	16.55	85000	82000	3930	4830	1172.8	1598.4
Metribuzin at 0.5 kg/fad.	19.15	18.70	34800	52000	2420	4500	675.0	868.2
Diphenamide at 1.5 kg/fad.	14.95	15.75	76600	65000	3170	3656	1195.7	1120.4
Tridex at 1.5 L/fad.	18.40	17.90	63600	85200	3820	6380	1026.7	1634.7
Phenisopham at 1.0 L/fad.	15.05	16.85	82600	75000	3530	4284	1241.6	1441.3
Linuron + Butralin Mix. *	18.80	18.45	68400	84600	4350	6600	1190.5	1645.2
Linuron + Oxadiazon	18.20	16.25	86600	73200	4586	5026	1291.5	1683.4
Linuron + Metribuzin	19.40	18.35	68000	76800	4530	6210	1365.0	1805.2
Linuron + Diphenamide	15.80	16.30	67000	75600	3160	4578	1135.0	1207.2
Linuron + Tridex	18.85	18.75	48200	67200	3380	5690	980.0	1811.3
Linuron + Phenisopham	15.90	15.35	84200	73200	4300	4898	1291.9	1575.9
Hoeing	16.55	17.60	66200	77400	3690	5106	1065.7	1595.2
Control	13.15	14.80	54000	69000	1700	2920	571.9	600.3
L.S.D. at 5%	0.36		2086		248		40.42	
1%	0.47		2754		328		53.35	

* Mixture rate were half of that of the individual herbicides rates.

responses of the weed control treatments in the two growing seasons of the study.

4. Protein and oil percentage:

The effect of the previous interaction on the protein and oil percentages were not statistically significant Table (25).

Experiment II:

Weeds directly compete with soybean plants for, soil nutrients, light, space and other growth requirements. The present investigation was undertaken objectively to study the effect of weed competition on soybean seed yield as well as the protein and oil seed contents.

The dominance weeds in this experiment were similar to that in the first experiment. The effect of duration of weeds competition were determined by leaving weeds to grow for different periods, i.e. 21, 42, 63, 84, 105 and at harvest, then weeds were removed by hand polling weekly to harvest date.

Effect of different weedy periods on soybean yield and its components:

The available data in Table (32) indicate the effect of weed competition at different periods throughout the growing season on soybean yield and its related characters, i.e. plant height, number of branches per plant, number of pods per plant, weight of pods per plant, seed index, seed yield per plant and seed yield per faddan.

1. Plant height:

Data in Table (32) reveal clearly that the following treatments: weed-free throughout the season, hoeing, weedy

Table (32): Effect of different weedy periods on yield and yield components of soybean. (Combined analysis of 1979 and 1980 experiments).

Treatments	Plant height in cms	No. of branches /plant	No. of pods/ plant	Weight of pods/ plant in gms	Seed index	Seed yield/ plant in gm	Seed yield/ F. in kg.
Weedy for 21 days from sowing	70.1c	3.2c	70.2é	48.2c	16.9c	17.1c	1448.8e
Weedy for 42 days from sowing	65.6b	2.5b	61.6d	35.6b	15.3b	14.6b	902.9d
Weedy for 63 days from sowing	61.9a	2.2ab	59.4d	33.3b	14.9b	14.4b	836.0c
Weedy for 84 days from sowing	62.3a	1.8a	56.2c	34.9b	14.3ab	13.9ab	757.9b
Weedy for 105 days from sowing	63.5ab	1.8a	52.7b	34.6b	13.4a	12.8a	714.5ab
Weedy throughout the growing season	61.3a	1.7a	49.7a	29.9a	13.5a	12.2a	693.4a
Hoeing	73.8d	3.4c	68.7e	50.9d	16.9c	17.7c	1431.8e
Weed-free throughout the growing season	75.9d	4.5d	74.7f	53.4d	17.4c	19.6d	1532.5f

Means followed by the same alphabetical letters are not statistically significant at the 5% level.

for 21 and 42 days from sowing increased to different extents the length of soybean plant height, while the other treatments, i.e. weedy for 63, 84 days from sowing and weedy throughout the growing season did not differ significantly in that respect from the control treatment. The tallest plants were obtained by weed-free throughout the growing season and hoeing treatments. The increases in the plant height due to these treatments amounted to 23.8 and 20.4% of the control treatment.

2. Number of branches per plant:

Data presented in Table (32) reveal that the effect of the studied treatments in this investigation on the number of branches per plant were similar to that of the plant height with some exceptions. The following treatments, weedy for 21, 42, 63 days from sowing, hoeing and weed-free throughout the growing season increased the number of branches per plant by 88.2, 47.1, 29.4, 100.0 and 164.7% of the control treatment (weedy for all throughout the growing season). On the contrary there were no significant differences among the other treatments, i.e., weedy for 63, 84, 105 days from sowing and weedy for all the grown season. Data also indicate that the weed-free throughout the season was superior on the hoeing treatment.

3. Number of pods per plant:

Data in Table (32) demonstrate that all studied treatments increased the number of pods per plant significantly as compared with the control treatment. The greatest number of pods were obtained by weed-free throughout the season. This increase amounted to 50.3% of the control. The differences between hoeing and weedy for 21 days from sowing were not significant gave increases amounted to 38.2 and 41.2%, respectively, of the control treatments.

4. Weight of pods per plant:

Results in Table (32) show that there were significant differences between any of the studied treatments and the control. Weed-free treatment all the growing season and hoeing caused the heighest weight of pods per plant followed by weedy for 21 days from sowing treatments. These increases due to those treatments amounted to 78.6, 70.2 and 61.2% of the control. On the other hand there were no significant differences among the following treatments; weedy for 42, 63, 84 and 105 days from sowing.

5. Seed index:

Results in Table (32) indicate that the following treatments; weed-free throughout the growing season,

hoeing, weedy for 21, 42 and 63 days from sowing increased seed index significantly, while the other treatments, i.e. weedy for 84 and 105 days from sowing did not differ significantly as compared with the control. The heaviest seed index which amounted to 28.9, 25.2 and 25.2% of the control were obtained by weed-free, hoeing and weedy for 21 days from sowing.

6. Seed yield per plant:

All treatments seems to have the same effect on the seed yield per plant except the weed-free throughout the growing season treatment which gave the highest seed yield per plant amounted to 60.6% of the control.

Also, hoeing treatment have the same effect of the weedy for 21 from sowing treatment. The increase due to these two treatments amounted to 45.1 and 40.2% of the control treatment.

7. Seed yield per faddan:

Results in Table (32) reveal that all treatments increased to different extents the seed yield per faddan if compared with the control treatment except the weedy for 105 days from sowing treatment.

The highest seed yield/fad. were obtained by the weed-free treatment followed by weedy treatment for 21

days from sowing and hoeing treatment. The increases due to these three treatments amounted to 121.0, 108.9 and 106.5% of the control.

The favourable effect of these treatments on seed yield per faddan could be attributed to weed elimination and less competitive effect which consequently affect the number of branches, number of pods, weight of pods per plant, seed index as well as seed yield per plant.

Also the following treatments; weedy for 42 and 63 days from sowing increased significantly the seed yield per faddan by 30.2 and 20.6% of the control, while there were no significant effect between weedy for 105 days and the control.

Generally, the available results in Table (32) indicate clearly that the percentage of seed yield per faddan reduction increased as the length of competition periods increased after 21 days from sowing. These depression reached to 50% or more by the weedy periods at 84 and 105 days after sowing as well as the control, as compared with the weed-free throughout the growing season. Meanwhile this depression amounted to 5.7 and 7.0% of the weed-free treatment by weedy for 21 days from sowing and hoeing treatment.

Similar results were obtained by many investigators; Wax and Slif (1967) and Bianco et al. (1973), who stated that keeping soybean fields weed-free for 30-50 days from sowing, gave soybean yield equal from those kept weed-free throughout the growing season. Hammerton (1974) and Makarov and Vatashki (1976), found that weed competition reduced soybean yields by 50-75%. Also Harrison and Oliver (1977) and Ramirez De Vallejo et al. (1977) demonstrated that the first 40-50 days are the critical weed competition period for soybeans and caused 72% yield reduction, but Mc Whorter and Anderson (1979), showed that the most critical period for control weeds was 4-10 weeks after soybean emergence. Thomas et al. (1978), found that no appreciable reductions in soybean yield occurred when soybeans were weedy for the first 2 weeks. Wetala (1978), declared that MCWL (minimum critical weed level) depended on variety and population of soybean plants.

Effect of different weedy periods on protein and oil percentages:

Data presented in Table (33) show the effect of the weed competition at different periods from soybean sowing on protein and oil percentage as well as protein and oil yield/fad.

Table ( ): Effect of different weedy periods on protein and oil percentages.
(Averages of 1979 and 1980 experiments).

Treatments Treatments	Protein %	Oil %	Protein yield/F in kgs.	Oil yield/F in kgs.
Weedy for 21 days	34.22	20.66	495.8	299.3
Weedy for 42 days	33.47	20.68	302.2	186.8
Weedy for 63 days	34.11	20.81	285.2	173.9
Weedy for 84 days	32.77	21.14	248.4	160.2
Weedy for 105 days	34.20	20.93	244.4	149.5
Weedy grown season	34.23	21.61	237.4	149.8
Hoeing three times	34.50	22.11	493.9	316.5
Weed-free throughout the grown season	34.66	21.04	531.2	322.4

The results indicate that there were no effect of the weedy periods on the protein and oil percentage in spite of the little decreases in protein percentage at weedy for 84 and 42 days from sowing as well as slight increases in oil percentages obtained by hoeing and weedy throughout the grown season. Concerning the protein and oil yield/fad., data show that the highest yield of protein and oil was obtained by each of weed-free throughout the growing season, weedy for 21 days from sowing and hoeing.