J. Agric. Sci. Mansoura Univ., 32 (10): 8089 - 8109, 2007

EFFECT OF VARIETIES AND WEED CONTROL TREATMENTS ON WEEDS, GROWTH CHARACTERS, YIELD AND YIELD COMPONENTS OF PEANUT(*Arachis hypogaea* L.)

Moshtohry, M.R.[1]; A.M. Nassar[1]; F.M. Ismail[2] and M.F.Ibrahim[1].
1 - Weed Research Central Laboratory, Agriculture Research Center.
2 – Field Crops Research Institute, Agriculture Research Center.

ABSTRACT

The present study including two field experiments were carried out in sandy soil in Ismailiah Agriculture Research Station during 2004 and 2005 successive summer seasons. The first experiment laid in split plot design was aimed to study the response of two peanut varieties Giza 6 and Gregory and ten weed control treatments being (1) Pendimethalin at 850 g/fed (2) Pendimethalin at 850 g/fed + hand hoeing (3) oxyfluorfen at 125 g/fed (4) oxyfluorfen at 125 g/fed + hand hoeing (5) Butralin at 1200 g/fed (6) Butralin at 1200 g/fed + hand hoeing (7) Fluazifop butyl at 187 g/fed (8) Clethodim at 125 g/fed (9) Hand hoeing (10) Unweeded check; on weeds, growth characters, yield and its components of peanut (*Arachis hypogaea* L.). In the second experiment complete randomized block design was used to study the effect of fourteen weed control treatments using the recommended rates and reduced rates (with TK1 nozzle) of herbicides on weeds, yield and its components of peanut. The treatments were (1) Pendimethalin at 850 g/fed (2) Pendimethalin at 425 g/fed (TK1) (3) Pendimethalin at 425 g/fed (TK1) + hand hoeing (4) Oxyfluorfen at 125 g/fed (5) Oxyfluorfen at 62.5 g/fed (TK1) (6) Oxyfluorfen at 62.5 g/fed + hand hoeing (7) Fluazifop butyl at 187.5 g/fed (8) Fluazifop butyl (TK1) at 93.75 g/fed (9) Fluazifop butyl (TK1) at 93.75 g/fed + hand hoeing (10) Clethodim at 125 g/fed (11) Clethodim at 62.5 g/fed (TK1) (12) Clethodim at 62.5 g/fed (TK1) + hand hoeing (13) Hand hoeing (14) Unweeded check.

The main findings from the first experiment concerning the effect of peanut varieties there were no significant response on weeds, yield and yield components. Butralin was considered as alternative for oxyfluorfen and pendimethalin against annual weeds which decreased dry weight by 85-92%.

Clethodim or fluazifop butyl were effective against grasses and decreased the dry weight by 84-99%. These herbicides minimized weed/peanut competition and consequently increased pod yield and yield components. Pendimethalin, butralin + hand hoeing and oxyfluorfen increased pod yield (ardab/fed.) by 376.7, 332.6 and 327.6% , respectively in the first season, while, oxyfluorfen, pendimethalin and butralin + hand hoeing increased pod yield by 300.0, 290.2 and 254.9%, respectively in the second season compared to the unweeded check.

The capacity of Giza 6 variety or Gregory for weed competition is very low, thus the yield of peanut was reduced by 71 and 73% under weed infestation by 1.168 and 2.033 t/fed of weed dry weight. Such reduction in the yield can be avoided with using different weed control treatments such as butralin, oxyfluorfen, pendimethalin which become more effective by adding hand hoeing after one month from sowing.

For the second experiment reducing the full recommended rates either for soil or post emergence herbicides for grasses with the use TK1 nozzle failed to give effective weed control similar to the full recommended rates and consequently reduced peanut yield and its components. Adding hand hoeing to the reduced rates improved weed control and increased pod yield to be equal or more than the full recommended rates. Thus, The highest pod yield was obtained from clethodim (TK1) + hand hoeing, fluazifop butyl (TK1) + hand hoeing and hand hoeing twice which

increased pod weight by 336.0, 319.4 and 294.4%, respectively in the first season, while hand hoeing twice, fluazifop butyl (TK1) + hand hoeing and oxyfluorfen (TK1) + hand hoeing gave the highest pod yield/fed. which was increased by 300.0, 266.0 and 242.4%, respectively in the second season, compared to unweeded check.

Thus, it is recommended for farmers to sustain peanut crop production by minimizing weed competition to use the full rates of herbicides such as butralin at 1200 g/fed applied post sowing or clethodim at 125 g/fed or fluazifop butyl at 125 g/fed. which should be applied in an integral approach. Also the results indicated that adding hand hoeing to the reduced rate (half rate) with TK1 nozzle improved weed control and increased seed yield of peanut as well as reducing pollution.

INTRODUCTION

Peanut (Arachis hypogaea L.) is considered as one of the important summer oil crops. The seeds contain about 50%oil and high quality protein. It is usually cultivated in light soil as well as in the reclaimed areas. The cultivated area is about 155.000 feddan in Egypt. Peanut suffer from weed competition due to its nature to grow in somewhat prostrate manner that it does not cover rapidly the soil. Thus the plant is exposed to competition for the majority of growing season (Zimdahl, 1979). Many researchers estimated yield losses in this crop due to weed competition by at least 50% in Libya (Orman1961), and up to 70%in Sudan (Drennan and Jennings, 1977) and 90% in Egypt (Fayed *et al*., 1990). This competition lie mainly in the 15-60 days after sowing peanut and the maximum was around 45 days after sowing (Yadav *et al*., 1984).Hand weeding is often more expensive justified by the value of crop (Buchanan *et al*., 1977). For these reasons it is very important to control weeds mechanically or chemically by herbicides.

The most promising pre emergence herbicide , for weed control in peanut is pendimethalin at 1.0 kg /ha [Carson(1979).Buchanan *et al*. (1982)]. Van Hoogstraten and Fine (1982) in Egypt found that pendimethalin at 1.0 and 2.0 kg/ha pre emergence gave excellent weed control (92%) compared to unweed check .Fayed *et al*. (1992) reported that the highest reduction in weed density was obtained by hoeing twice as well as pendimethalin at 1.74 fed .pre emergence . Ibrahim (1995) showed that pendimethalin at 850 g/fed gave the highest reduction on dry weight of annual weeds.

Grichar and Boswell (1986) reported that fluazifop butyl applied at 280 and 410 g a. i./ha gave annual grass control ranging from 97% to 100% Pamplona and Tinapay (1987) found that fluazifop butyl and sethoxydim were the two of the most promising herbicides for controlling grass weeds in peanut. Doulias (1990) found that fluazifop butyl at 0.21 to 0.28 kg/ha gave 93and 96.1% control. Burke *et al* .(2004) reported that clethodim at 140 g a.i/ha controlled crop grass and panicum by at least 90% El-Sehly(2005) found that fluazifop butyl , clethodim and butralin gave the highest reduction in dry weight of annual weeds.

Prasad *et al*. (1987) reported that oxfluorfen at 0.12-0.15kg/ha gave effective control of broadleaved weeds and grasses for up to 60 days after

sowing peanut. Ibrahim (1995) found that oxyfluorfen at 240g/fed was most effective in controlling annual weeds.

EL-Sehly(2005) reported that butralin at1200 g.a.i/fed decreased dry weights of annual weeds by 81.4 and78.5% for the first and second season, respectively compared to unweeded check.

Van Hoogstraten and Fine (1982) mentioned that the average increase in groundnut yield with pendimethalin at 1-2kg (a.i/ha)was 32% over the hand weeded treatment .Bhan *et al*. (1983) found that pendimethalin pre emergence 1.0-2.0 kg a.i/ha gave significantly higher pod yields up to 3090kg/ha than did the weed control(1250kg/ha). Choudary (1983) found that two hand hoeings outyielded the weedy check by 80% Silva *et al*. (1983) reported that no differences on peanut pod yield between pendimethalin at 2.0kg/ha and hand weeding twice .Yadav *et al*. (1984) found that weeds decreased the number of pods/plant ,100 kernel weight and pod yield/ha by 70.0%,6.4%and 12.1%,respectively,compared to the weeds free plots .Colvin *et al*. (1985), noticed that two hand hoeing gave yields about 89% over unweeded check. Kondap *et al*. (1985) reported that hand weeding 1.5 kg pendimethalin/ha and 0.5 kg/ha, fluazifop butyl were similar in their effects on seed protein content, but were significantly higher than without weed control. Prasad *et al*. (1987) pointed that oxyfluorfen at 0.12-0.15kg/ha pre emergence in groundnut gave pod yield 3.21-3.25t/ha compared to 3.03 t/ha hand-weeded and hoed plots and 1.38t for unweeded controls .Panwar *et al*. (1988) found that fluazifop butyl increased pod yield by 68% over a weedy check. Fayed *et al*. (1992) found that hoeing and pendimethalin 1.7 l/fed had no significant effect on oil percentage .yields of these chemicals were significantly increased by weed control treatments. Straw yield increased significantly by hand hoeing and pendimethalin. Ibrahim (1995) found that hand hoeing; pendimethalin gave highest straw and pod yield .there were no significant differences in oil percentage. Kumar *et al* .(2003) found that hoeing and pendimethalin + hoeing recorded pod and kernel yield of 32.5,32.1 and 21.6,23.0 q/ha compared to 12.5 and 7.3q/ha under unweeded check. El-Sehly (2005) found that fluazifop butyl at 187.5 g.a.i/fed gave the highest number and weight of seeds/plant , number and weight of pods / plant, 100 seed weight, pod yield ardab/fed , straw yield t/fed and oil yield kg/fed .

Thus this study aimed to evaluate the efficacy of some pre emergence herbicides for controlling weeds on two varieties of peanut to sustain its production as well as evaluating reduced rates of these herbicides by using TK1 nozzle with or without hand hoeing.

MATERIALS AND METHODS

This investigation included two field experiments which were carried out at El-Ismailiah Agricultural Research Station, Agricultural Research Center (ARC) during 2004 and 2005 successive summer seasons.

First experiment:

This experiment aimed to study the response of two peanut (*Arachis hypogaea* L.) varieties Giza 6 and Gregory and its growth, yield, yield components as well as the effect of these weed control treatments on the dry weight of weeds (g/m^2)**.**Treatments were arranged in split-plot design with three replications The main plots were allocated for peanut varieties, while weed control treatments were arranged in the sub plots as follows:-

A- Main plots (peanut varieties**):-**

1- Giza 6
2- Gregory

B-Sub plots (**Weed control treatments):-**

1- Pendimethalin 50%EC [N- (1- ethlpropyl) 3,4 – dimethyl – 2,6 – dinitro benzenamine] known commercially Stomp at the rate of 850 g (a.i.)/fed. applied post sowing.
2- Pendimethalin 50% EC at the rate of 850 g (a.i)/fed applied post sowing+ hand hoing 30 days after herbicide treatment.
3- Oxyfluorfen 12.5 % EC [2- chloro –1– (3– ethoxy – 4 – nitrophenoxy) – 4 – nitrifluoromethyl benzen] known commercially as Goal at the rate of 125 g (a.i.)/fed.applied post sowing.
4-Oxyfluorfen 12.5% EC at the rate of 125 g (a.i.) / fed. applied post sowing+ hand hoeing 30 days after herbicide treatment.
5- Butralin 48% EC (N-secondary-butyl-4- tertiary-2,6 dinitroaniline) known commercially , as Amex at the rate of 1200 g (a.i.)/fed applied post sowing.
6- Butralin 48% EC at the rate of 1200 g (a.i.)/fed applied post sowing+ hand hoeing 30 days after herbicide treatment.
7- Fluazifop-p-butyl 12.5% EC [Butyl –2– (4 (5– trifluoromethyl –2– pyridyloxy) phenoxy) propionate] known commercially as Fusilade super at the rate of 187 g (a.i.) / fed.as post–emergence foliar spraying,30 days after sowing.
8-Clethodim 12.5% EC {(±)-2-[(E)-1-[(E)-3-chloroallyloxyimino] propyl]-5-[2-(ethylthio)propyl]-3-hydroxycyclohex-2-enone]}known commercially as Select super at the rate of 125 g (a.i)/fed. applied as post-emergence foliar spraying, 30 days after sowing.
9- Hand-hoeing twice: 30 and 45 days after sowing.
10- Weedy check (control treatment).

Second experiment

This experiment aimed to study the effect of the recommended rate and the half recommended rate of some pre and post emergence herbicides and the integration between the half recommended rate of these herbicide and hand hoeing on the dry weight of weeds (g/m^2), growth , yield, yield components. The treatments were arranged in complete randomized block design with four replicates as follows:-

1- Pendimethalin 50 % EC at the rate of 850 g (a.i.) / fed. applied into the soil surface post sowing but before irrigation (pre-emergence)
2- Pendimethalin 50% EC at the rate of 425 g (a.i)/fed applied post sowing by TK1 nozzle.

3- Pendimethalin 50% EC at the rate of 425 g (a.i)/fed applied post sowing by TK1 nozzle + hand hoeing one month after spraying.
4- Oxyfluorfen 12.5 % EC at the rate of 125 g (a.i.) / fed. applied post sowing
5-Oxyfluorfen 12.5% ECat the rate of 62.5 g (a.i.) / fed. applied post sowing by TK1 nozzle.
6-Oxyfluorfen 12.5% ECat the rate of 62.5 g (a.i.) / fed. applied post sowing by TK1 nozzle.+ hand hoeing one month after spraying .
7- Fluazifop-p-butyl 12.5% EC at the rate of 187 g (a.i.) / fed.as post–emergence foliar spraying,30 days after sowing.
8- Fluazifop-p-butyl 12.5% EC at the rate of 93.5g (a.i.) / fed.as post–emergence foliar spraying by TK1 nozzle 30 days after sowing.
9- Fluazifop-p-butyl 12.5% EC at the rate of 93.5g (a.i.) / fed.as post–emergence foliar spraying by TK1 nozzle 30 days after sowing + one hand-hoeing after 30 days from spraying.
10- Clethodim 12.5% EC at the rate of 125 g (a.i)/fed. applied as post-emergence foliar spraying, 30 days after sowing.
11- Clethodim 12.5% EC at the rate of 62.5 g (a.i)/fed. applied as post-emergence foliar spraying by TK1 nozzle 30 days after sowing.
12- Clethodim 12.5% EC at the rate of 62.5 g (a.i)/fed. applied as post-emergence foliar spraying by TK1 nozzle 30 days after sowing+ one hand-hoeing after 30 days from spraying.
13- Hand-hoeing twice: 30 and 45 days after sowing.
14-Weedy check (control treatment):

Experimental plots were 21 m^2(5m. length and 4.2 m. width),peanut varieties Giza6 and Gregory seeds (35kg/fed.) were inoculated with the specific strain of *Bradyrhizobium* sp, then sown in rows (60 cm apart and 10 cm between hills). Sowing took place on the first week of May and harvested in the first week of October in both seasons. Herbicidal treatments were sprayed with a knapsack sprayer (CP3) at a volume rate of 200 l/fed. Irrigation was done with sprinkler irrigation system at 3 day intervals. The preceding winter crop in both seasons was wheat (*Triticum aestivum* L.).The other recommended agronomic practices for peanut growing were applied property. The soil in the experimental area was sandy textured.

Data Recorded:

Weed assessments:

Weeds were removed from selected randomly one square meter after 75 days from sowing. The weeds were identified according to **Tackholm (1974)**.The dry weight of total of annual weeds per m^2 was calculated.

At harvest time, 10 plants from each plot area were removed and the following characters were recorded:

1- Plant length (cm).
2- Dry weight (g/plant).
3- Number of pods per plant.
4- Weight of pods per plant (g).
5- Number of seeds per plant.
6- Weight of seeds per plant (g).

Yield:

At harvest, the plants of two rows from each experimental plot were removed to determine the straw yield ton/fed and seed yield (ardab/fed).

Oil percent:

The oil content of peanut seeds was determined according to the **A.O.A.C. (1975)** methods.

Statistical analysis:

Data obtained was subjected to statistical analysis according to **Snedecor and Cochran (1967)** and the least significant differences (LSD) at 5 % level of significance were calculated.

RESULTS AND DISCUSSION

First experiment:

Effect of weed control treatments on weeds, yield and yield components of two peanut varieties:

A. Weeds :

The dominant annual weeds in the experimental site were *Digitaria sanguinalis* L.*, Dactyloctenium aegyptium* L.*, Cenchrus* sp. and *Echinochloa colonum* L. as annual grassy weeds and *Portulaca oleraceae* as annual broadleaved weed.

Results indicated that no significant differences were noticed between Giza 6 and Gregory variety of peanut in controlling annual grassy, broadleaved and total weeds in both seasons.

Data in table (1) show the effect of weed control treatments on annual grassy, broadleaved and total weeds in 2004 and 2005 seasons.

In 2004 season clethodim herbicide, fluazifop-butyl ,and hand hoeing oxyfluorfen + hand hoeing were the most effective in controlling grassy weeds under Giza 6 variety, while pendimethalin + hand hoeing, hand hoeing alone, pendimethalin and fluazifop-butyl were more effective in controlling grassy weeds under Gregory variety. These results are in harmony with those obtained by **Grichar and Boswell (1986), Pamplona and Tinapay (1987), Doulias (1990)** and **Burke *et al*. (2004)** They showed that fluazifop butyl and sethoxydim were the two of the most promising herbicides for controlling grassy weeds.

With regard to weed control treatments in both varieties hand hoeing followed by fluazifop-butyl followed by butralin + hand hoeing followed by pendimethalin + hand hoeing which gave the best results by 93.2, 92.5, 92 and 88.3%, respectively.

Concerning broadleaved weeds oxyfluorfen, butralin + hand hoeing, butralin and hand hoeing decreased dry weight with significant differences compared to other weed control treatments under Giza 6 variety while oxyflurofen, oxyflurofen + hand hoeing, hand hoeing alone and pendimethalin + hand

hoeing gave the best results under the other variety. These results are in agreement with those of Prasad *et al*. (1987) and Ibrahim (1995) They reported that oxyflurofen gave effective control of broadleaved weeds.

Table 1: Effect of varieties and weed control treatments on dry weight of annual weeds (g/m^2)

Weed control treatment	Rate a.i g/fed	Grassy weeds g/m^2 V1	Grassy weeds g/m^2 V2	Mean	Broad-leaved weeds g/m^2 V1	Broad-leaved weeds g/m^2 V2	Mean	Total weeds g/m^2 V1	Total weeds g/m^2 V2	Mean
2004 season										
Pendinethalin	850	229.9	24.2	127.1	108.2	114.6	111.4	338.1	138.8	238.5
Pendimethalin + hand hoeing	850	51.9	18.4	35.2	56.2	28.1	42.2	108.1	46.5	77.3
Oxyfluorfen	125	251.5	132.2	191.9	0.0	0.0	0.0	251.5	132.2	191.9
Oxyfluorfen+ hand hoeing	125	26.6	48.9	37.8	17.1	0.7	8.9	43.7	49.6	46.7
Butralin	1200	125.4	221.8	173.6	2.5	88.2	45.4	127.9	310.0	219.0
Butralin + hand hoeing	1200	0.6	47.7	24.2	0.0	68.9	34.5	0.6	116.6	58.6
Fluazifop-butyl	187.5	12.9	32.5	22.7	236.1	270.3	253.2	249.0	302.8	275.9
Clethodim	125	0.0	92.3	46.2	549.8	395.3	472.6	549.8	487.6	518.7
hand hoeing twice		19.9	21.0	20.5	7.6	2.3	5.0	27.5	23.3	25.4
Unweed check		274.0	328.4	301.2	90.7	98.6	94.7	364.7	427.0	395.9
Mean		102.6	96.7		106.8	106.7		212.7	206.2	
LSD at 5% level										
Varieties A		N.S			N.S			N.S		
Weed control treatments B		127.9			155			161.5		
Interaction A X B		180.9			219.2			228.3		
2005 season										
Pendimethalin	850	223.1	28.2	125.7	0.0	0.0	0.0	223.1	28.2	125.7
Pendimethalin + hand hoeing	850	19.3	0.8	10.1	2.6	62.4	32.5	21.9	63.2	42.6
Oxyfluorfen	125	192.1	118.1	155.1	3.2	46.4	24.8	195.3	164.5	179.9
Oxyfluorfen+ hand hoeing	125	53.4	61.3	57.4	3.1	2.0	2.6	56.5	63.3	59.9
Butralin	1200	49.5	98.5	74.0	0.0	108.9	54.5	49.5	207.4	128.5
Butralin + hand hoeing	1200	4.5	62.6	33.6	0.0	30.7	15.4	4.5	93.3	48.9
Fluazifop-butyl	187.5	70.7	72.0	71.4	340.4	182.1	261.3	411.1	254.1	332.6
Clethodim	125	7.3	0.0	3.7	791.5	382.2	586.9	798.8	382.2	590.5
hand hoeing twice		8.0	13.0	10.5	2.2	5.7	4.0	10.2	18.7	14.5
Unweed check		224.9	484.6	354.8	53.2	218.1	135.7	278.1	702.7	490.4
Mean		86.30	98.9		119.60	101.9		200.40	180.90	
LSD at 5% level										
Varieties A		N.S			N.S			N.S		
Weed control treatments	B	122.40			167.60			148.00		
Interaction		173.10			180.80			209.30		

Results also show that oxyfluorfen, hand hoeing and oxyfluorfen + hand hoeing gave the least dry weight of broadleaved weeds under both varieties which decreased dry weight by 100, 94.7 and 90.6%, respectively compared to unweeded check.

Regarding the total weeds butralin + hand hoeing, hand hoeing, oxyfluorefen + hand hoeing and pendimethalin + hand hoeing were more effective under Giza 6 variety, while hand hoeing, pendimethalin + hand hoeing, oxyflurofen + hand hoeing and butralin + hand hoeing gave the least dry weight under the Gregory variety. Hand hoeing, oxyflurofen + hand hoeing, butralin + hand hoeing and pendimethalin + hand hoeing gave the best results under both varieties which decreased dry weight by 93.6, 88.2, 85.2 and 80.5%, compared to unweeded check respectively. These results are in the same trend as those obtained by Carson (1979).

In 2005 season, results showed that butralin + hand hoeing, clethodim, hand hoeing and pendimethalin + hand hoeing under the Giza 6 variety gave the least grassy dry weight. While clethodim, pendimethalin + hand hoeing, hand hoeing and pendimethalin were more effective under the Gregory variety. Clethodim followed by pendimethalin + hand hoeing followed by hand hoeing alone under the two varieties which decreased dry weight of grassy weeds by 98.9, 97.2 and 97.0% compared to unweeded check respectively.

Concerning broadleaved weeds each of pendimethalin, oxyflurofen and butralin with or without hand hoeing were effective in controlling broadleaved weeds as well as hand hoeing treatment. This was true under varieties.

Pendimethalin, oxyflurofen + hand hoeing, hand hoeing and butralin + hand hoeing decreased dry weight of broadleaved weeds in the average by 100, 98.1, 97.1 and 88.7% compared to unweeded check , respectively.

Butralin + hand hoeing, hand hoeing and pendimethalin + hand hoeing under the first variety , while hand hoeing, pendimethalin and pendimethalin + hand hoeing under the other variety gave the best results in controlling total weeds.

Concerning total weed control in both varieties, hand hoeing, pendimethalin + hand hoeing, butralin + hand hoeing and oxyfluorfen + hand hoeing decreased dry weight of total weeds by 97.0, 91.3, 90.0 and 87.8% compared to unweeded check, respectively . Many researchers mentioned similar results, Carson (1979), Buchanan *et al.* (1982), Van Hoogrestraten and Fine (1982) and Fayed *et al*. (1992) pointed out that pendimethalin gave the best results on decreasing weights of annual weeds. Grichar and Boswell (1990), Pamplona and Tinapay (1987), Doulias (1990), Burke (2004) and El-Sehly (2005) also indicated the efficacy of fluazifop butyl and sethoxydin on weeds. Prasad *et al.* (1982) reported that oxyfluorfen gave effective control of annual weeds. El-Sehly (2005) and Khozimy (2006) mentioned that butralin gave the highest reduction on dry weight of annual weeds.

B- Yield and yield components: -

Results in tables (2, 3and 4) indicate the effect of varieties and weed control treatments on yield and yield components of peanut in both seasons. Varieties did not differ significantly in yield components.

3

1- Weight of plant (g)

Unweeded check gave the least significant dry weight of plant in varieties and weed control treatments in both seasons. Weed control treatments were variable in their effect on dry weight of plant in both seasons .

2 - Number of seeds / plant :-

The only treatment decreased significantly number of seeds / plant was unweeded check compared to all weed control treatments which did not differ significantly either under varieties or in the average of varieties. This was true in both season. In general hand hoeing gave the highest number of seeds /plant either under varieties or under weed control treatments in both seasons.

3 - Weight of seeds g / plant

Generally, the same trend of number of seeds / plant was observed on weight of seeds g / plant.

4 - Number of pods/plant

In general, no significant differences were obtained between varieties concerning yield and yield components of peanut.

In 2004 season pendimethalin, fluazifop butyl, butralin+hand hoeing oxyfluorfen and hoeing increased significantly number of pods / plant compared to other treatments under Giza 6 variety, while butralin + hand hoeing, butralin, fluazifop butyl and oxyfluorfen gave the highest number of pods / plant under the other variety. For the average of varieties butralin + hand hoeing, fluazifop butyl, pendimethalin, and oxyfluorfen gave the best results which increased number of pods / plant by 285, 258, 220 and 210%, respectively compared to unweeded check.

In 2005 season, pendimethalin, butralin + hand hoeing, hand hoeing + oxyfluorfen gave the highest number of pods / plant under Giza 6 variety, while pendimethalin, fluazifop butyl, hand hoeing and butralin gave the best results under the Gregory variety.

For the average of both varieties, pendimethalin, hand hoeing , butralin + hand hoeing and fluazifop butyl gave higher weight pods / plant by 125, 103, 96 and 93%, respectively compared to unweeded check .

5 - Weight of pods / plant (g)

In 2004 season, Pendimethalin + hand hoeing, butralin + hand hoeing , fluazifop butyl and butralin gave the heaviest pod weight/ plant under the Giza 6 variety, while hand hoeing, oxyfluorfen+ hand hoeing, butralin + hand hoeing and fluazifop butyl increased weight of pods / plant under the Gregory variety.

Concerning weed control treatments on the average no significant differences were obtained between all weed control treatments but all exceeded unweeded check significantly. Butralin + hand hoeing , pendimethalin + hand hoeing , fluazifop butyl and hand hoeing gave the highest pod weight / plant which increased by 351.2 , 337.8 , 336.6 and 328.0 % , respectively compared to unweeded check.

In 2005 season , fluazifop butyl , hand hoeing , oxyfluorfen , hand hoeing and butralin + hand hoeing gave higher pod weight / plant under the Giza 6 variety while hand hoeing , pendimethalin , butralin + hand hoeing

and oxyfluorfen + hand hoeing had the highest pod weight / plant under the Gregory variety. On the average hand hoeing followed by pendimethalin and butralin increased weight of pods per plant by 252.7, 221.4 and 203.6 %, respectively compared to unweeded check.

6 - Weight of 100 seeds (g) :-

In 2004 season, butralin + hand hoeing, clethodim and oxyfluorfen + hand hoeing gave higher weight of 100 seeds under Giza 6 variety. Pendimethalin + hand hoeing, clethodim and hand hoeing gave higher weights under the Gregory variety. In the average of varieties pendimethalin + hand hoeing , , clethodim and butralin + hand hoeing increased 100 seeds weight by 12.7 , 11.8 and 10.4 % , respectively compared to unweeded check .

In 2005 season, no significant differences were noticed between weed control treatments under Giza 6 variety. On the other hand no significant differences were obtained between weed control treatments except between oxyfluorfen + hand hoeing and oxyfluorfen under the other variety. For the average oxyfluorfen treatment decreased significantly the weight of 100 seeds compared to all weed control treatments which had no significant differences.

7 – Pods yield (ardab/fed.)

In 2004 season, butralin + hand hoeing, pendimethalin and oxyfluorfen + hand hoeing gave the highest seed yield under Giza 6 variety, while hand hoeing gave the lowest seed yield . pendimethalin, oxyfluorfen and pendimethalin + hand hoeing gave the highest seed yield under Gregory variety. In the average pendimethalin, butralin + hand hoeing and oxyfluorfen increased grain yield by 376.7,332.6 and 327.6%, respectively compared to unweeded check.

In 2005 season, butralin + hand hoeing, pendimethalin and oxyfluorfen + hand hoeing gave the highest seed yield under the Giza 6 similar to the above mentioned results in 2004 season. Under the second variety oxyfluorfen, pendimethalin and clethodim gave the best results. For the average oxyfluorfen, pendimethalin and butralin + hand hoeing increased seed yield by 300.0, 290.2 and 254.9%, respectively compared to unweeded check. Hand hoeing had the lowest seed yield compared to the herbicidal treatments.

These results are in the same trend of that obtained by **Bhan *et al***.(1983), Choudary (1983), Silva *et al*.(1983), Yadav *et al*.(1984), Kondap *et al*.(1985), Prasad *et al*.(1987), Panwar *et al*. (1988), Fayed *et al.* (1992), El-Sehly (2005), Kumar (2005) and Khozimy (2006).

8- Straw yield (ton/fed.)

In 2004 season, no significant differences were observed between weed control treatments under the Giza 6 variety all weed control treatments, however, increased significantly straw yield compared to unweeded check. While there was variable results in the other variety, pendimethalin gave the highest straw yield followed by oxyfluorfen. In the average, pendimethalin, oxyfluorfen and pendimethalin + hand hoeing increased straw yield by 134.9 m 126.8 and 100.8%, respectively compared to unweeded check.

In 2005 season, the same trend was noticed either in the main treatments, (varieties) or the sub-treatments (weed control treatments). On the average pendimethalin, oxyfluorfen and pendimethalin + hand hoeing increased straw yield by 122.3, 91.4 and 91.4%, respectively compared to unweeded check. These results are in agreement with those obtained by Fayed *et al.* (1992), El-Sehly (2005) and Khozimy (2006).

9- Oil percentage

In general, it was clear from the results in both seasons that weed control treatments did not have any effect on oil percentage and there were also no significant differences between varieties. These results are in agreement of that obtained by Fayed *et al.* (1992), Ibrahim (1995) and Khozimy (2006).

Second experiment

A- Weeds

Effect of full and reduced rates of herbicides on weed control in peanut fields:

The dominant annual weeds at Ismailiah Agricultural Research Station were *Cenchrus* sp, *Echinochloa colonum* L., *Digitaria sanguinalis* L. and *dactyloctenium aegyptium* as annual grassy weeds and *Portulaca oleraceae* L. as annual broadleaved weeds .

Table (5) shows that in 2004 season, all reduced rates of used herbicides to half gave higher dry weights of grassy weeds than the full recommended rates. Adding hand hoeing to the reduced rate increased the effectiveness in controlling grassy weeds. This was true with all herbicides used. The only significant difference was between unweeded check and other weed control treatments. Clethodim (TK1) + hand hoeing , pendimethalin (TK1) + hand hoeing , fluazifop butyl and oxyfluorfen (TK1) + hand hoeing were more effective in decreasing dry weight of grassy weeds by 97.7, 97.3, 96.4 and 95.8 % respectively compared to unweeded ckeck..

In 2005 season, the same trend was observed concerning grassy weeds. Hand hoeing , clethodim (TK1) + hand hoeing , fluazifop butyl (TK1) + hand hoeing and fluazifop butyl gave the highest decrease in dry weight of grassy weeds by 93.7 , 92.6, 91.4 and 81.7 % respectively compared to unweeded check .Weed infestation in unweeded check was less than that recorded in the first year.

Concerning broadleaved weeds, in 2004 season pendimethalin and oxyfluorfen at the full rate or reduced rate applied with TK1 nozzle with or without hand hoeing controlled the only broadleaved weed *Portulaca oleraceae* with high efficiacy and reaching 100% control. Hand hoeing and clethodim (TK1)+hand hoeing ranked the second .On the other hand, broadleaved weed dry weight was less than grasses which may be attributed to the high infestation of grassy weeds in plots.

In 2005 season,the same trend was noticed ,dry weight of broadleaved weeds, however, was higher accompanied by lower weights of grassy weeds compared to the first season.

Regarding total weeds, in 2004 season, pendimethalin (TK1) + hand hoeing ,oxyfluorfen (TK1) + hand hoeing , clethodim (TK1) + hand hoeing and

hand hoeing gave the lowest dry weight of total annual weeds which decreased by 97.4,95.9,94.4 and 92.3 %,respectively compared to unweeded check.

Reduced rates of herbicides with applying TK1 nozzle gave the highest dry weights of total annual weeds.

In 2005 season ,hand hoeing, fluazifop butyl (TK1) + hand hoeing , oxufluorfen (TK1) + hand hoeing and oxyfluorfen were more effective in decreasing dry weight of total annual weeds by 89.3, 85.3, 83.9 and 83.8% respectively compared to unweeded check. These results are in the same trend of those obtained by Carson (1979), Buchanan *et al*. (1982), Doulias (1990), Fayed *et al*. (1992), Van Hoogstraten and Fine (1992), Ibrahim (1995), El-Sehly (2005) and Khozimy (2006).

B-yield and yield components:

Data in Table 6 shows the effect of full and reduced rates of herbicides on yield and yield components of peanut in 2004 and 2005 season.

1- Number of pods/plant:

Herbicide treatments affected significantly number of pods/plant, thus fluazifop butyl, oxyfluorfen and pendimethalin gave the highest number of pods/plant in 2004 and 2005 seasons which increased by 194.3,177.0 and 166.7% in the first season and 232.1, 282.2 and 211.5 % in the second season , respectively compared to unweeded check. Reduced herbicides rate with TK1 followed by hand hoeing gave results higher or equal to the full rate of herbicide.

2- Weight of pods/plant

In 2004 season the same trend as that of number of pods/plant that fluazifop butyl TK1+hand hoeing, oxyfluorfen and pendimethalin gave the highest pod weights, while in 2005 season fluazifop butyl TK1+ hand hoeing, pendimethalin TK1+ hand hoeing and pendmehtalin gave the highest weight of pods/plant. The above mentioned treatments increased pod weight by 196.7, 167.9, 154.7and 201.1, 192.1, 188.9 % for the first and second season, respectively compared to unweeded check.

3- Number of seeds/plant

Oxyfluorfen, fluazifop butyl TK1+ hand hoeing and pendimethalin gave the highest number of seeds/plant in the first season which increased by 188.2, 185.4 and 177.1%, respectively. Hand hoeing twice, clethodim TK1 + hand hoeing and fluazifop butyl TK1 hand hoeing were the best and increased seeds number/plant by 269.6, 258.3 and 256.5% respectively ,compared to unweeded check in the second season.

4- Weight of seeds/plant

Fluazifop butyl TK1+ hand hoeing, pendimethalin, pendimethalin TK1 +hand hoeing gave the best weight in the first season that increased weight of seeds/plant by 202.6 ,166.7 and 160.5 % respectively in the first season . Hand hoeing, oxyfluorfen TK1 + hand hoeing and fluazifop butyl TK1 + hand hoeing increased seed weight/plant by 261.5, 254.1 and 250.8 % respectively in the second season compared to unweeded check.

5- Weight of 100 seeds/plant

Results in table (6) indicate that fluazifop butyl, oxyfluorfen TK1 and fluazifop butyl TK1+ hand hoeing gave the highest weight of 100 seeds which increased by 10.3, 10.3 and 9.4 %, respectively compared to unweeded check in the first season, while fluazifop butyl, fluazifop butyl TK1 + hand hoeing and clethodim TK1 gave the best results and increased weight of 100 seeds by 4.0, 3.3 and 3.1 %, respectively compared to unweeded check in the second season.

6-Straw yield ton/fed:

From the results in Table 6 clethodim, hand hoeing and fluazifop butyl TK1 gave the highest straw yield ton/fed which increased by 73.3, 66.7 and 66.7% respectively compared to unweeded check in the first season.

Pendimethalin, pendimethalin TK1 + hand hoeing and fluazifop butyl TK1 gave the highest straw yield which increased by 141.7, 141.7and 141.7% respectively compared to unweeded check in the second season.

7- Pod yield ardab/fed:

Data in Table 6 show that clethodim TK1 +hand hoeing, pendimethalin TK1+hand hoeing and fluazifop butyl TK1 +hand hoeing gave the highest pod yield ardab/fed that increased by 336.1, 325.0 and 319.4%, respectively compared to unweeded check in the first season .Oxyfluorfen TK1 +hand hoeing, pendimethalin and fluazifop butyl TK 1 +hand hoeing gave the highest pod yield which increased by 276.3,267.8 and 266.1%,respectively compared to unweeded check in the second season . It is clear from the results that adding hand hoeing to the reduced rate increased pod yield of peanut to be equal or more than that of the full rate of herbicide and hand hoeing twice treatment.

8- Oil percentage:-

There were no significant differences between weed control treatments on oil percentage in both seasons.

The results of yield and yield components are in harmony with those obtained by Bhan *et al.* (1983), Choudary (1983), Yadav *et al*. (1984), Kondap *et al*. (1985), Panwar *et al.* (1988) Fayed *et al*. (1992), Van Hoogstraten and Fine (1992), Ibrahim (1995), El-Sehly (2005), Kumar *et al.* (2005) and Khozimy (2006).

Conclusion

In both experiments leaving weeds to compete with peanut plants caused yield reduction estimated by 73.2 and 65.1% in experiment 1 and 81.7 and 75% in experiment 2. These losses are attributed to the reduction in different yield components namely, number of seeds or pods /plant, weight of seeds or pods/plant and weight of 100 seeds. As comparison between hand hoeing and herbicides from the point of view of their effects on peanut yields and yield components, all these treatments exerted increases in peanut yield varied from 0.9 to 36.9% with treatments of oxyfluorfen , pendimethalin , butralin , fluazifop butyl and clethodim, which are considered as alternatives to mechanical hoeing to minimize weed/peanut competition and consequently sustaining peanut productivity.

Thus it is recommended for farmers to use butralin at 1200 g/fed. as pre emergence herbicide and fluazifop butyl or clethodim as post emergence in their full rates for weed management in this crop and sustaining peanut production under sandy soil conditions. It is also recommended to add hand hoeing to the reduced rate (half rate) for improving weed control and increasing seed yield of peanut to be equal or more than that of the full rate of herbicides and hand hoeing twice treatment and consequently reduced pollution.

REFERENCES

A, O.A.C. (Association of Official Analytical chemists), Washington D.C. (1975) Official and tentative methods of analysis of the Association of Official Agricultural chemists, 158, 8 third.

Bhan , V.M. ; S-K Yadav and S.P Singh (1983) Oxadiazon and pendimethalin for control of weeds in groundnut . Tropical Pest Management 29(3) :274-276 (C.F Weed Abst.34(1) :29) .

Buchanan, G. A.; D. S. Murray and E. W. Hausser (1982) Weed and their control in peanut. P. 206-249 in H. E. Pattec and C. T. Young. Eds. Peanut Science and Technology. Am. Peanut Res. and Ed. Soc. Yoakum, Tx.

Buchanan, G. A.; P. A. Backman and R. Rodriguez-Kabana (1977) Influence of oxadiazon on peanut and weeds. Peanut Sci. 4 (1) : 37-41.

Burke, I. C.; A. J. Price; J. W., Wilcut; D. L. Jordan ; A. S. , Culpepper and J. T. Ducar (2004). Annual grass control in peanut (*Arachis hypogaea*) with clethodim and Imazapic. Weed Technol. 18, 88-92.

Carson, A. G. (1979) Weed competition anmd control in groundnuts (*Arachis hypogaea*) Ghana, J. of Agr. 9:169-173 (C.F. Weed abstr. 29(8); 2377,1980).

Choudary, A. H. (1983) Weed control in groundnut in irrigation projects in Nigerian Savanna. Tropical pest Management, 29(3):277-283. (C.F. Weed abstr. 34(1):30,1985).

Colvin, D. L.; G. R. Wehtje; M. Patterson and R. H. Walker (1985) Weed management in minimum-tillage peanut (*Arachis hypogaea*) as influenced by cultivar, row spacing mid herbicides. Weed Sci. 33. (2) 233-237.

Doulis, C. G. (1990) Field evaluation of various herbicides in soybeans. Zizaniology 3(3):177 (C. F. Field crop Abst. 43(10) 7226, 1990).

Drennan, D. S. H. and E. A. Jennings (1977) Weed competition in irrigated cotton (*Gossypium barbadense* L.) and groundnut (*Arachis hypogaea* L.) in the Sudan Gezira. Weed Res. 17:3-9.

El-Sehly, S. E. (2005) Weed control in peanut and its effect on exportation characters. Ph. D. Thesis, Fac. Of Agric., Al-Azhar Univ.

Fayed, M. T.; S. M. El-Nagar and H. Fawzy (1990) Solarization and mechanical weed control in peanuts (*Arachis hypogaea* L.) Proc. 4th Conf. Agron., Cairo, 15-16 Sept. 11:465-480.

Fayed, M. T.; S. M. El-Nagar and H. Fawzy (1992) Performance of several weed control programs in peanut (*Arachis hypogaea* L.) Growth of weed species. Proc. 5th Conf. Agron., Fac. Of Agric., Zagazig Univ., Egypt Vol II, 1044-1060.

Grichar, W. J. and T. E. Boswell (1986) post emergence grass control in peanut (*Arachis hypogaea* L.). Weed Sci. 34 (4)587-590.

Ibrahim, M. F. (1995) Effect of some herbicides on groundnut in newly reclaimed soils. M. Sc. Thesis, Fac. Of Agric., Al-Azhar Univ.

Khozimy, A. M. H. (2006) The role of some herbicides for controlling weeds and their side effects on peanut crop. M. Sc. Thesis, Fac. of Agric. Suez Canal Univ.

Kondap, S. M.; V. U. Rani; V. Rajagopal; A. R. Rao and G. B. Reddy (1985) Effect of herbicides on nutrient uptake by weeds and crop and also on quality of groundnut genotypes – Ann. Conf. of Indian Soc. Of Weed Sci., 60-61. (C. F. Weed abst. 35(5):1540).

Kumar, Y., M. S. Skaktawat; S. Singh and O. P. Gill (2003) Effect of sowing dates and weed control methods on yield attributes and yield of groundnut (*Arachis hypogaea* L.). Indian J. of Agron. 48 (1):56-58.

Orman, P. A. (1961) Experiments on the control of weeds in groundnuts in Tripolitania. Weed Res. 1: 211-228.

Pamplona, P. and S. Tinapay (1987) The potential of new generation post emergence herbicides for increasing food production in the Philippines. ACIAR Proceedings Series Australian center for International Agricultural Research (1987) No. 18, 296 (C. F.Field crop Abst. 43(2) 1298, 1990).

Panwar, R. S.; R. K., Malik and V. M., Bhan (1988) Chemical weed control in groundnut. Indian J. Agron. 33, 458-459.

Prasad, T. V. R., N. Narasimha, N. Dwara Kanath and K. Křishnamurthy (1987) Efficacy of oxyfluorfen for weed control in irrigated groundnut. International Arachis Newsletter, (1987) No. 2, 9-11 (C. F. Field crop Abst. 42(2): 930-1989).

Silva, J. F.; L. M. D. Costa and C. M. D. Silva (1983) Effect of weed control with herbicides on bioduction and physiological quality of groundnut (*Arachis hypogaea* L.) seeds. Planta Daninha 6, 115-122.

Snedecor, G. W. and W. E. Cochran (1967) Statistical Methods. 6th ed Iowa State Univ. Press, Ames.

Tackholm, V. (1974) Student´s Flora of Egypt 2 th ed. Cairo Unv., Egypt Graphical Service, Beirut, Lebanon.

Van Hoogstraten ; S.D. and R.R Fine (1982). Pendimethalin : A review of its herbicide potential in the tropics. Proc.Brit.Crop Protec.Conf. Weeds , 838.

Yadav, S. K; S. P., Singh and V. M. Bhan (1984) Crop-Weed competition studies in groundnut (*Arachis hypogaea* L.) J. Agric. Sci. 103(2):373-376.

Zimdahl, R, L. (1979) Weed-Crop competition (A review) pp 1-197. Port Collina, Colorado/ USA.

دراسة تأثير الأصناف ومعاملات مكافحة الحشائش على الحشائش وصفات النمو والمحصول ومكوناته لمحصول الفول السوداني

محمد رضا مشتهرى[1] - أكرم نصار محمد السيد نصار[1]- فوزي محمد اسماعيل[2] و معوض فضل الله ابراهيم[1]

1 - المعمل المركزي لبحوث الحشائش و مركز البحوث الزراعية بالجيزة

2 – معهد بحوث المحاصيل الحقلية و مركز البحوث الزراعية بالجيزة

اشتملت هذه الدراسة على تجربتين حقليتين في تربة رملية بمحطة البحوث الزراعية بالإسماعيلية خلال الموسمين الصيفين لعامي 2004 ,2005 وكان تصميم التجربة الأولى قطع منشقة مرة واحدة بهدف دراسة تأثير صنفين من الفول السوداني هما جيزة 6 وجريجورى تم وضعهما بالقطع الرئيسية وعشر معاملات مكافحة حشائش بالقطع الشقية وهى: 1- بندبمثالين 850جم مادة فعاله/فدان 2- بندبمثالين 850جم + عزقة 3- أوكسى فلورفين بمعدل 125 جم/ف 4- أوكسى فلورفين بمعدل 125جم/ف + عزقة 5- بيوترالين بمعدل 1200جم/ف 6- بيوترالين بمعدل 1200 جم/ف + عزقة 7- فلوزيفوب بيوتيل بمعدل 187جم/ف 8- كليثوديم بمعدل 125جم/ف 9- عزيق مرتين 10- بدون معاملة على نمو الحشائش ومحصول الفول السوداني ومكوناته ونسبة الزيت.

وأجريت التجربة الأخرى في تصميم قطاعات كاملة العشوائية لدراسة تأثير عدد 14 معاملة مكافحة حشائش على الحشائش والمحصول ومكوناته في الفول السوداني ونسبة الزيت وكانت المعاملات: 1- بنديمثالين 850 جم 2 – بنديمثالين 450 جم (TK1) 3 – بنديمثالين 425 (TK1) + عزقة 4 – اوكسي فلورفين 125 جم 5 - اوكسي فلورفين 125 جم (TK1) . 6 - – اوكسي فلورفين 125 جم (TK1) + عزقة 7 – فلوزيفوب بيوتيل 187.5 جم 8 - فلوزيفوب بيوتيل 93.75 جم (TK1) 9 - فلوزيفوب بيوتيل 93.75 جم (TK1) + عزقة 10 – كليثوديم 125 جم 11 - كليثوديم 62.5 جم (TK1) 12 - كليثوديم 62.5 جم (TK1) + عزقة 13 – عزيق مرتين 14 – بدون معاملة.

أشارت النتائج المتحصل عليها من التجربة الأولى إلى عدم وجود تأثيرات معنوية للصنفين على الحشائش والمحصول ونسبة الزيت بينما أعطى مبيد البيوترالين بمعدل 1200جم/ف كفاءة اباديه للحشائش وزيادة في المحصول توازى كفاءة الأوكسى فلورفين والبنديمثالين ضد الحشائش الحولية والتي قللت الأوزان الجافة للحشائش بمقدار 85-92%، كليثوديم أو الفلوزيفوب بيوتايل بمقدار 84-99% كما أن هذه المبيدات نجحت في تقليل منافسة الحشائش و بالتالي زيادة إنتاجية المحصول ومكوناته من الفول السوداني . أعطت معاملات بنديمثالين وبيوترالين + عزيق وأوكسى فلورفين زيادة فى محصول القرون (اردب /فدان) بمقدار 376.7 و 332.6 و 327.6 % فى الموسم الاول بينما أعطت معاملات أوكسى فلورفين وبيوترالين+ عزيق زيادة بمقدار 392.2 و 254.4 % فى الموسم الثانى مقارنة بمعاملة الكنترول .

وكانت الكفاءة التنافسية لصنفي الفول السوداني منخفضة جدا حيث نقص محصول الصنفين بمقدار 71, 73% تحت مستوى غزارة من الحشائش مقدارها 1.168 ، 2.33 طن مادة جافة للفدان. ومثل هذا النقص في محصول الفول السوداني يمكن تجنبه باستخدام مختلف معاملات مكافحة الحشائش المتاحة من البيوترالين والأوكسى فلورفين والبندبمثالين والتي يمكن أن تصبح أكثر فعالية بإضافة عزقه بعد شهر من الزراعة .

هذا وقد أدى إنقاص المبيدات الموصى بها سواء من المبيدات الأرضية أو المبيدات بعد الإنبات إلى النصف باستخدام بشبورى TK1 إلى نقص في نسبه الفعالية من الحشائش عن المعدلات الكاملة الموصى بها وبالتالي نقص المحصول ومكوناته. وعند اضافة عزقة الى المعدلات الاقل زادت من كفاءة مكافحة الحشائش كما زاد المحصول بما يوازى او يزيد عن المعدلات الكاملة , وقد أعطت معاملات كليثوديم (TK1)+عزيق فلوزيفوب بيوتيل(TK1) +عزيق , وعزيق مرتين الى زيادة محصول القرون بمقدار 336.0 و 319.4 و 294.4 % فى الموسم الاول بينما أعطى العزيق مرتين فلوزيفوب بيوتيل(TK1) + عزيق و أوكسى فلورفين (TK1) +عزيق زيادة بمقدار 300.0 و 266.0 و 242.4 % فى الموسم الثانى مقارنة بمعاملة الكنترول.

من ذلك يمكن التوصية باستخدام المعدلات الكاملة من المبيدات الموصى بها مثل مبيد البيوترالين بمعدل 1200 جم/ف على التربة أو مبيد كليثوديم بمعدل 125جم/ف أو الفلوزيفوب بيوتيل بمعدل 125جم/ف ويمكن استخدام هذه المعاملات بشكل متكامل مع النقاوة اليدوية للمحافظة على إنتاجية محصول الفول السوداني وأيضا يجب نصح المزارعين باضافة عزقة عند استخدام المعدلات الأقل من المبيدات(نصف المعدل) لتحسين كفاءة المكافحة ولزيادة المحصول بالاضافة الى تقليل التلوث البيني .

Table 2: Effect of varieties and weed control treatments on yield components of peanut in 2004 and 2005 seasons

Weed control treatment	Rate a.i	2004 Season Dry weight /plant (g)		Mean	2005 Season Dry weight /plant		Mean	2004 Season No. of seeds /plant		Mean	2005 Season No. of seeds /plant		Mean	2004 Season Weight of Seeds/plant		Mean	2005 Season Weight of Seeds/plant		Mean
		V1	V2		V1	V2		V1	V2		V1	V2		V1	V2		V1	V2	
Pendimethalin	850	73.9	71.1	72.5	36.4	67.8	52.1	28.5	24.8	26.7	21.6	31.5	26.6	21.5	18.2	19.9	17.7	25.5	21.6
Pendimethalin + hand hoeing	850	71.4	76.5	74.0	64.0	68.6	66.3	32.1	22.3	27.2	26.5	20.8	23.7	27.2	18.5	22.9	18.5	17.9	18.2
Oxyflurofen	125	63.5	61.9	62.7	48.7	64.0	56.4	26.8	24.9	25.9	27.1	18.3	22.7	22.1	20.9	21.5	16.3	19.6	18.0
Oxyfluorfen+ hand hoeing	125	59.9	66.6	63.3	51.4	65.7	58.6	25.8	29.7	27.8	27.2	27.1	27.2	17.5	21.7	19.6	21.0	21.4	21.2
Butralin	1200	61.1	55.4	58.3	64.7	69.6	67.2	28.4	25.2	26.8	20.7	18.0	19.4	22.7	22.2	22.5	17.1	18.2	17.7
Butralin + hand hoeing	1200	72.9	73.7	73.3	62.0	50.9	56.5	30.1	26.7	28.4	22.7	32.4	17.3	23.2	24.0	23.6	19.6	19.6	19.6
Fluazifop-butyl	187.5	90.0	47.6	68.8	85.3	77.4	81.4	30.7	25.3	28.0	29.4	28.9	29.2	23.0	27.4	25.2	24.8	21.4	23.1
Clethodim	125	62.5	66.9	64.7	49.3	61.6	55.5	19.9	28.6	24.3	24.8	24.0	24.4	16.7	21.4	19.1	24.1	21.1	22.6
hand hoeing twice		81.4	62.0	71.7	73.9	65.2	69.6	23.9	35.2	29.6	32.5	32.5	32.5	18.2	28.8	23.5	7.1	27.3	17.2
Unweeded check		19.4	25.5	22.45	22.8	28.5	25.7	7.5	6.4	7.0	11.5	11.8	11.7	5.9	9.2	7.6	8.2	9.2	8.7
Mean		65.6	60.7		55.9	62.0		25.4	24.9		24.3	23.8		19.8	21.3		18.4	20.2	

LSD at 5% level						
Varieties A	N.S	N.S	N.S	N.S	N.S	N.S
Weed control treatments B	15.3	16.8	9.6	10.1	7.9	8.2
Interaction AX B	21.8	23.8	13.6	14.3	11.2	11.6

Table (3) Effect of varieties and weed control treatments on yield components of peanut in 2004 and 2005 seasons

Weed control treatments	Rate a.i	2004 Season No. of pods /plant		Mean	2005 Season No. of pods /plant		Mean	2004 Season Pods weight /plant		Mean	2005 Season Pods weight /plant		Mean	2004 Season Weight of 100 seeds		Mean	2005 Season Weight of 100 seeds		Mean
		V1	V2		V1	V2		V1	V2		V1	V2		V1	V2		V1	V2	
Pendimethalin	850	24.1	14.2	19.2	24.7	20.3	22.5	31.2	29.3	30.3	36	42.1	39.1	76.7	81.6	79.2	78.8	85.5	82.2
Pendimethalin + hand hoeing	850	15.3	15.0	15.2	9.9	12.5	11.2	39.9	31.9	35.9	30.8	26.9	28.9	78.5	88.2	83.4	81.4	80.1	80.8
Oxyfluorfen	125	19.7	17.1	18.4	20.2	18.0	19.1	32.4	31.4	31.9	22.6	34.5	28.6	64.6	81.8	73.2	70.3	73.8	72.1
Oxyfluorfen+ hand hoeing	125	14.8	17.5	16.2	16.6	16.1	16.4	28.5	36.3	32.4	32	31.8	31.9	79.6	83.0	81.3	83.3	88.9	86.1
Butralin	1200	16.4	18.9	17.7	17.2	18.2	17.7	34.0	27.1	30.6	28.2	37.2	32.7	79.7	78.5	79.1	81.0	84.6	82.8
Butralin + hand hoeing	1200	23.4	22.8	23.1	22.7	16.5	19.6	39.3	34.7	37.0	31.2	29.5	30.4	85.6	77.7	81.7	76.6	79.5	78.1
Fluazifop-butyl	187.5	24.5	18.5	21.5	18.5	20.1	19.3	36.9	34.6	35.8	37.5	34.4	36.0	78.8	73.1	76.0	79.3	78.8	79.1

Clethodim	125	15.9	17.5	16.7	17.0	14.1	15.6	25.5	32.9	29.2	28.4	31.3	29.9	80.0	85.3	82.7	81.6	83.7	82.7
hand hoeing twice		18.8	17.3	18.1	21.1	19.5	20.3	26.7	43.4	35.1	36.3	42.6	39.5	78.8	82.5	80.7	75.7	80.7	78.2
Unweeded check		7.5	4.6	6.1	8.5	19.5	14.0	8.8	7.5	8.2	12.2	10.1	11.2	74.0	73.9	74.0	81.0	77.5	79.3
Mean		18.0	16.4		17.7	17.5		30.3	30.9		28.5	32.1		77.6	80.6		78.9	81.3	
LSD at 5% level																			
VarietiesA		N.S			N.S			N.S			N.S			N.S			N.S		
Weed control treatments B		4.3			4.4			12.0			11.6			8.9			9.2		
Interaction AX B		6.0			6.3			17.0			15.4			12.5			13.0		

Table (4) Effect of varieties and weed control treatments on yield of peanut in 2004 and 2005 seasons

Weed control treatments	Rate a.i g/fed	2004 Season			2005 Season			2004 Season			2005 Season			2004 Season			2005 Season		
		Pod yield Ardab/fed		Mean	Pod yield Ardab/fed		Mean	Straw yield kg/fed		Mean	Straw yield kg/fed		Mean	Oil %		Mean	Oil %		Mean
		V1	V2		V1	V2		V1	V2		V1	V2		V1	V2		V1	V2	
Pendimethalin	850	20.2	20.8	20.5	19.2	20.6	19.9	2.35	3.44	2.90	2.84	3.35	3.10	53.2	52.9	53.1	51.9	51.6	51.8
Pendimethalin + hand hoeing	850	17.2	17	17.1	17.2	16.3	16.8	2.21	2.81	2.51	2.28	3.05	2.67	50.6	51.6	51.1	50.4	52.8	51.6
Oxyflurofen	125	16.9	19.9	18.4	18.9	21.8	20.4	2.45	3.13	2.79	2.53	2.79	2.66	52.9	53.2	53.1	52.0	52.1	52.1
Oxyfluorfen+ hand hoeing	125	20.2	15.4	17.8	19.1	14.8	17.0	2.42	2.32	2.37	2.30	2.33	2.32	45.4	54.3	49.8	52.5	53.6	53.1
Butralin	1200	16.5	15.4	16.0	16.9	15.6	16.3	2.16	2.50	2.33	2.52	2.01	2.27	52.6	51.7	52.1	51.6	51.7	51.7
Butralin + hand hoeing	1200	20.4	16.8	18.6	19.8	16.4	18.1	2.20	2.21	2.21	2.52	2.62	2.57	53.4	52.4	52.9	53.7	52.2	52.9
Fluazifop-butyl	187.5	16.7	15.3	16.0	16.8	14.8	15.8	2.47	2.25	2.36	1.89	2.04	1.97	52.1	52.3	52.2	53.1	52.6	52.8
Clethodim	125	17.2	16.1	16.7	17.9	16.7	17.3	1.73	2.57	2.15	1.55	2.47	2.01	53.0	51.8	52.4	53.5	52.0	52.7

hand hoeing twice	15.5	15.3	15.4	14.3	15.4	14.9	2.27	2.04	2.16	2.08	1.91	2.00	52.9	53.5	53.2	53.4	53.1	53.2
Unweeded check	4.5	4.1	4.3	5.1	5.2	5.2	1.07	1.30	1.19	1.36	1.42	1.39	54.0	53.2	53.6	52.9	52.7	52.8
Mean	16.5	15.6		16.5	15.7		2.13	2.42		2.19	2.42		52.0	52.7		52.5	52.5	
LSD at 5% level																		
Varieties A	N.S			N.S			N.S			N.S			N.S			N.S		
Weed control treatments B	2.3			2.1			0.68			0.64			2.97			1.62		
Interaction A X B	4.7			4.4			0.96			0.90			4.21			2.29		

Table (5): Effect of full and reduced rates of herbicides on weed control of weeds in peanut fields in 2004 and 2005 seasons.

Weed control treatments	Rate a.i. g/fed	2004 season			2005 season		
		Grasses g/m²	Broadleaved g/m²	Total g/m²	Grasses g/m²	Broadleaved g/m²	Total g/m²
Pendimethalin	850	106.6	0	106.6	74.6	0	74.6
Pendimethalin (Tk_1)	425	121	8	129	94.1	23.1	117.2
Pendimethalin (Tk_1) + hand hoeing	425	11.8	0	11.8	70.6	0	70.6
Oxyfluorfen	125	96	0	96	62.1	0	62.1
Oxyfluorfen (Tk_1)	62.5	107.2	0	107.2	96	0	96
Oxyfluorfen (Tk_1) + hand hoeing	62.5	18.5	0	18.5	60.5	0.6	61.1
Fluazifop butyl	187	15.6	94.7	110.3	40	50.3	90.3
Fluazifop butyl (Tk_1)	93.5	80	64.7	144.7	95	147	242
Fluazifop butyl (Tk_1) + hand hoeing	93.5	31.2	44.4	75.6	18.8	37.3	56.1

Clethodim	125	61.9	61	122.9	46.4	92	138.4
Clethodim (Tk_1)	62.5	113.7	47.8	161.5	58.4	85.2	143.6
Clethodim (Tk_1) + hand hoeing	62.5	10.2	15.8	25.3	16.1	57.3	73.4
Hand hoeing	-	19.6	15.4	35	13.7	27.3	41
Unweeded check	-	439.2	14.4	453.6	218	164.4	382.4
LSD		160.4	28.5	170.3	53.8	120.1	54.3

Table (6): Effect of full and reduced rates of herbicides on yield and yield components of peanut during 2004 and 2005 seasons.

Weed control treatments	Rate a.i g/fed	No of pods / plant		Weight of seeds/plant		No of seeds / plant		Weight of seeds/plant		Weight of 100 seeds		Straw yield ton /fed		Pod yield ardab/fed		Oil %	
		2004 S	2005 S	2004 S	2005 S	2004 S	2005 S	2004 S	2005 S	2004 S	2005 S	2004 S	2005 S	2004 S	2005 S	2004 S	2005 S
Pendimethalin	850	23.2	24.3	46.1	54.6	39.9	42.5	30.4	31.3	79.4	76.9	1.9	2.9	7.4	21.7	52.6	53.2
Pendimethalin (Tk_1)	425	18.4	17.4	34.4	40.1	28.9	34.6	22.1	24.4	76.2	76.6	2.0	2.4	4.1	16.3	53.3	52.5
Pendimethalin (Tk_1) + hand hoeing	425	23.2	22.7	45.7	55.2	37.5	48.5	29.7	40.3	79.2	78.1	2.0	2.9	15.3	21.0	52.7	52.4
Oxyfluorfen	125	24.1	25.6	48.5	53.9	41.5	43.6	26.6	18.8	82.6	74.9	1.7	2.6	4.9	19.9	52.9	51.9
Oxyfluorfen (Tk_1)	62.5	17.2	17.2	38.4	40.4	24.2	33.1	22.9	21.5	83.0	79.8	1.4	2.6	2.0	17.5	52.4	54.3
Oxyfluorfen (Tk_1) + hand hoeing	62.5	17.8	18.4	33.9	48.1	27.2	52.3	21.2	43.2	80.2	78.4	2.4	2.7	7.5	22.2	52.8	53.0
Fluazifop butyl	187	19.9	19.0	40.8	46.8	33.1	50.2	27.1	37.5	83.0	82.6	1.7	2.5	8.8	18.0	53.1	52.9
Fluazifop butyl (Tk_1)	93.5	18.4	19.3	39.1	44.7	32.4	36.8	25.1	29.5	80.7	76.3	2.5	2.9	10.8	17.7	53.5	52.9
Fluazifop butyl (Tk_1) + hand hoeing	93.5	25.6	25.9	53.7	56.9	41.1	59.9	34.5	42.8	82.8	82.0	2.3	2.3	15.1	21.6	52.1	51.7

Clethodim	125	14.5	14.3	29.8	33.5	24.3	41.6	18.8	36.9	78.4	79.4	2.6	1.7	12.8	11.4	53.1	52.9
Clethodim (Tk_1)	62.5	13.2	13.7	26.9	31.2	21.9	36.0	17.4	32.8	81.9	81.9	2.3	2.4	14.1	12.4	53.4	52.5
Clethodim (Tk_1) + hand hoeing	62.5	17.1	17.2	34.6	39.2	27.7	60.2	22.3	41.7	79.9	80.7	2.0	2.7	15.7	16.3	52.5	52.3
Hand hoeing	-	21.2	20.3	40.7	49.8	33.9	62.1	26.3	44.1	77.4	76.2	2.5	2.4	14.2	21.4	53.3	53.1
Unweeded check	-	8.7	7.8	18.1	18.9	14.4	16.8	11.4	12.2	75.2	79.4	1.5	1.2	3.6	5.9	52.6	53.0
LSD		7.1	7.3	14.4	16.8	11.8	12.7	11.6	12.4	6.4	9.4	0.8	0.6	3.7	5.4	N. S	N. S