Global Journal of Science Frontier Research
Agriculture and Veterinary
Volume 13 Issue 6 Version 1.0 Year 2013
Type : Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Influence of Herbicides and Agriculture Density on Weeds Associated with Crop Soybean (Glycine Max L)

By A.A.A. Hassan

Botany Department National Research Center, Cairo Egypt

Abstract - Two filed experiments were conducted at the Agricultural Experimental Farm during two seasons, to study some weed control treatments and plant density (distance between plants) on weeds competition in soybean fields. Each experiment included 16 treatments which were the combination of 8 weed control treatments (6 herbicides beside hoeing and un weeded treatment) and two distances between plants namely, 5 and 10 cm (70000 & 140000 plants/fed.). The obtained results showed that the favorite weed control treatments were hoeing (twice) followed by trifurlin and diphenamid in 1st and 2nd season, hoeing (twice) treatment gave the highest decrease in total fresh weight of weeds, followed by pndimethalin, dinitramine and linuron. The total fresh weight of weeds was significantly decreased at 5cm distance between plants as compared with those at 10cm distance. The effect of the interaction between weed control treatments and distance between plants caused a significant effect on fresh weight of weeds. The effect of hoeing (twice) on fresh weight of weeds at narrow plant distance was greater than that at 10 cm distance.

Keywords : *herbicides, agriculture density, weed, soybean.*

GJSFR-D Classification : *FOR Code: 070199, 820405*

Strictly as per the compliance and regulations of :

Influence of Herbicides and Agriculture Density on Weeds Associated with Crop Soybean (Glycine Max L)

A.A.A. Hassan

Abstract - Two filed experiments were conducted at the Agricultural Experimental Farm during two seasons, to study some weed control treatments and plant density (distance between plants) on weeds competition in soybean fields. Each experiment included 16 treatments which were the combination of 8 weed control treatments (6 herbicides beside hoeing and un weeded treatment) and two distances between plants namely, 5 and 10 cm (70000 & 140000 plants/fed.). The obtained results showed that the favorite weed control treatments were hoeing (twice) followed by trifurlin and diphenamid in 1st and 2nd season, hoeing (twice) treatment gave the highest decrease in total fresh weight of weeds, followed by pndimethalin, dinitramine and linuron. The total fresh weight of weeds was significantly decreased at 5cm distance between plants as compared with those at 10cm distance. The effect of the interaction between weed control treatments and distance between plants caused a significant effect on fresh weight of weeds. The effect of hoeing (twice) on fresh weight of weeds at narrow plant distance was greater than that at 10 cm distance. No significant difference in fresh weight of weeds were obtained between dinitramin ,linuron, trifluralin and prometryne treatments at 5 cm distance between plants, but this was not the case at the distance 10 cm between plants.

Keywords : herbicides, agriculture density, weed, soybean.

I. Introduction

The presence of weeds in soybean fields reduces crop yield from 40 to 50 percent depending on the intensity of weed in visitation Idapuganti et al. (2005) observed *Echinochloa colona, Cyperus rotandus, Trianthema portulacastrum, Digera arvensis, Commelina benghalensis, Digitaria sanguinalis, Phyllanthus niruri* and *Dactyloctenium aegyptium* in soybean crop. Guliqbal et al. (2005) reported *Cyperus rotandus, Dactyloctenium aegyptium, Eragrostis piolsa and Commelina benghalensis* in soybean field. Kushwah and Vyas (2006) found *Caesulia axillaris, Echinochloa colona, Cyperus iria, Cyperus rotandus, Commelina benghalensis, Digitaria sanguinalis and Acalypha indica* in soybean crop. Malik et al. (2006) identified *Celosia argentea, Digera arvensis, Echinochloa colona, Dactyloctenium aegyptium, Cyperus rotandus* and Trianthema portulacastrum in soybean field. Bhan et al., (1972). Dowler and parker (1975) mentioned that cultivation plus hand hoeing gave the best weed control.

Many investigators found that prometryne Singh et al., (1973) and Doersch,"(1980). Linuron Sanchez, (1974); Baronova et al. (1975) and Abdel Raouf and Fayed, (1978), hoeing treatment Fayed et al., (1983). Trifluralin and metribuzin at 1.0 + 0.5 kg/ha Cruz et al., (1980), stomp Moursi et al., (1980), linuron-butralin mixture Salim, (1982) and prometryne, prometryne + amex, prometryne + ronstar and hoeing treatments Moshtohory (1982) gave a favourite effect on weeds.

Chauhan et al. (2002) revealed that the application of alachlor at 1.5 kg and, pendimethalin 1.5 kg /ha as pre-emergence and two hand weeding at 20 and 35 DAS in soybean crop drastically reduced weed density, weed biomass and increased the yield of crop. Rohitshav et al. (2003) reported that pre-emergence application of pendimethalin 1.5 kg /ha produced soybean grain yields similar to weed free treatment. Rajput and Kushwah (2004) observed that pre-emergence application of pendimethalin at 1.0 kg/ha followed by one hand weeding at 30 days after sowing was the most profitable for controlling the weeds in soybean

Pandya *et al.* (2004) found that two hand weedings and clomazone with hand weeding produced higher grain yield. Crop geometrics failed to record significant influence on grain yield.

Rajput and Kushwah (2004) observed that two hand weeding alone 20 and 30 DAS after sowing gave highest weed control efficiency 85.6% with seed yield 1860 kg/ha.

Not only herbicides but also the plant density are among the factors that have an important role in keeping soybean fields free of weeds. Gurnah (1978) showed a very high plant population gave better weed control than lower populations. The present investigation was carried out to influence of herbicides and agriculture density on weeds associated with crop soybean (*Glycine max* L)

II. Matrial and Methods

Two filed experiments were conducted at the agricultural experimental farm during two seasons,. the soil of the experiments was clay loam with medium fertility, containing 1.89% organic matter and p^H7.8.

Author : Botany Department National Research Center, Cairo Egypt.
E-mail : hagahmomedhassan@yahoo.c

A Factorial experiment in randomized complete block design with four replicates was used. The plot size was 20 m^2 (4 m x5 m) with 5 rows (5 m in length and 70 cm apart); Each experiment included 16 treatments which were the combinations between 8 weed control treatments and 2 plant densities.

a) Weed control treatments were as follow

1. Dintramine (cobex or USB 3584): N^3, N^3- Diethyl 2,4 –Dinitro -6- trifluoromethyl-1,3- phenylenediamine (2.5 % E.C) at a rate of 1.0 L/fad.
2. Pendimethalin (stomp, Ac. 92553) N (1-Ethylpropyl)- 2,6 dinitro-3,4-xylidine (33%E.C) at a rate of 2.5 L/fad.
3. Trifluralin (Treflan): Trifluoro 2, 6 – dinitro-N-N dipropyl-p-toluidine (48% E.C) at a rate of 1.0 L/fad.
4. Prometryne (Gesagard 50 % a.i. w.p.) 2 methoxy 4, 6 bis isopropyl amino 2 methyl thio 1,3,5 triazine at a rate of 1.0 Kg/fad.
5. Linuron (Afalon 50% a.i, w.p.) N 1, 3, 4- dichloro-phenyl N-methoxy-N-methyl urea at a rate of 1.0 Kg/fad.
6. Diphenamid (Enide 50% W.P.) N-N-dimethyl-2, 2-diphenyl acetamide at a rate of 2.0 Kg/fad.
7. Hand hoeing (Twice) after 15 and 25 days from sowing.
8. Control (un weeded).

b) Distance between plants were as follows:

1. 5 cm between plants (140000 plants / fad).
2. 10 cm between plants (70000 plants /fad).

All herbicides were sprayed on soil surface and incorporated immediately into the soil and irrigation was carried out on the same day. The used rates were as product form. Sprayers sack with water volume of 200 liters per faddan was used.

Soybean seeds var. Clark were sown on 24th and 18th of April in the 1st and 2nd seasons, respectively. When the soil moisture was adequate for germination, after thinned in order to give the proper distance between plants and density. Nitrogen fertilizer was applied at 100 kg /fad. in the form of urea (46%N).

Weeds were hand pulled from one line of the middle row of each plot after 30th and 60th days from sowing and calculated to gramme per square meter. Fresh weight of weed species and total weeds were recorded to the nearest gramme.

All data obtained in both seasons were subjected to the proper statistical analysis for both seasons as well as the combined analysis was also carried out according to Snedecor and Cochran (1967). Treatment means were compared using Duncan's multiple range test (Duncan, 1955) at the 5% level of probability.

III. Results and Discussion

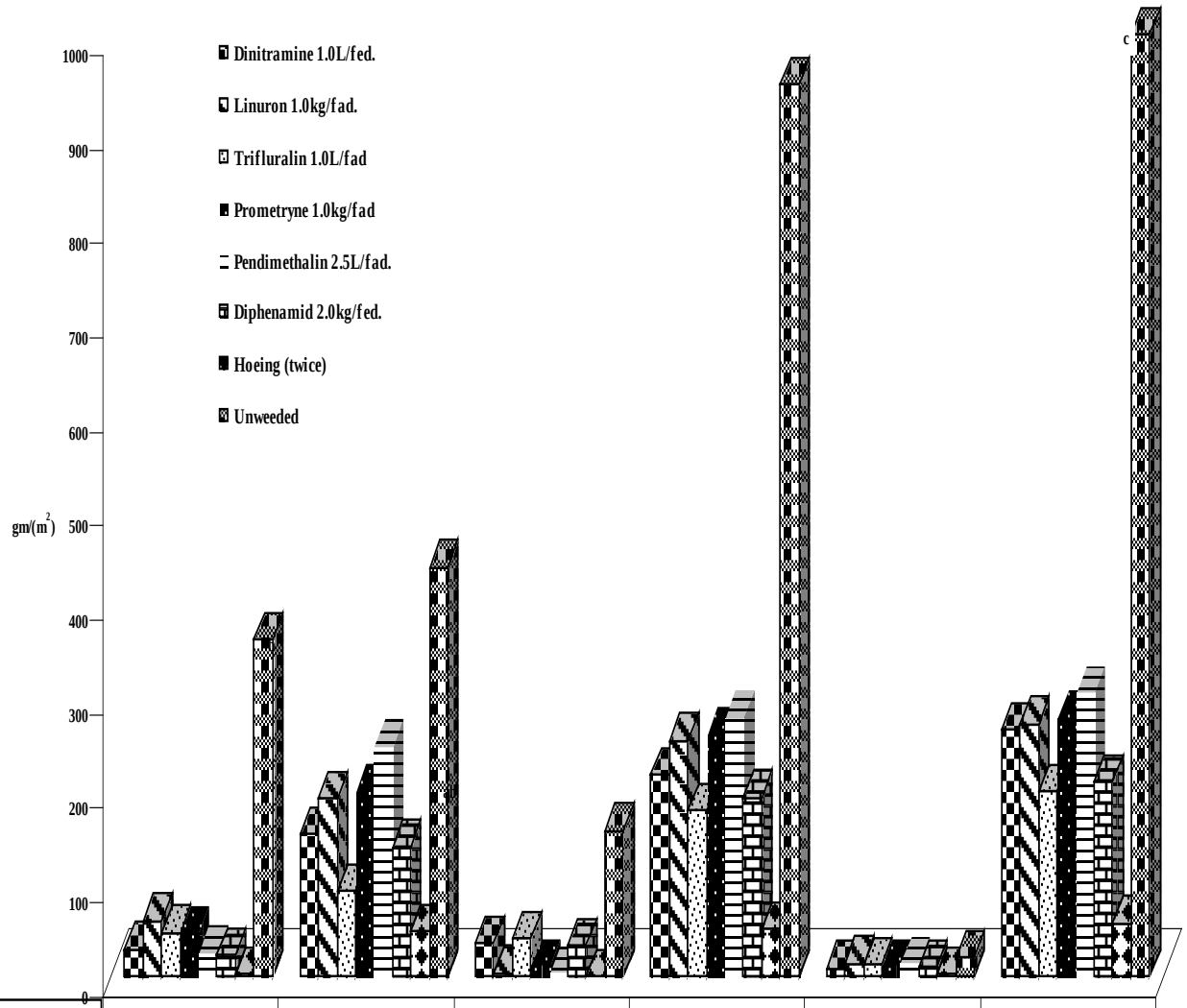
a) Effect of weed control treatments on weeds

The major weed species associated with the soybean crop in 1st seasons were mostly broad–leaved weeds and they were as follow, *Portulaca olera*ceae L. (*Purslane), Chenopodium murale* L. (Goose foot), *Amaranthus caudatus* L. (Pig weed). In 2nd season, the prevailing weeds were; *Beta vulgaris* L. (leaf beet), *Chenopodium murale* L. (Goose foot), *Medicago hispida* L. and *Echinocloa colonum* (Jungle rice) as the only grass weed. In both seasons *Cyperussp.* L. (nut sedge) was the only perennial weed appeared in the field plots.

Data recorded in Figures (1-4) showed the effect of weed control treatments on the fresh weight of weeds assessed at 30 and 60 days from sowing.

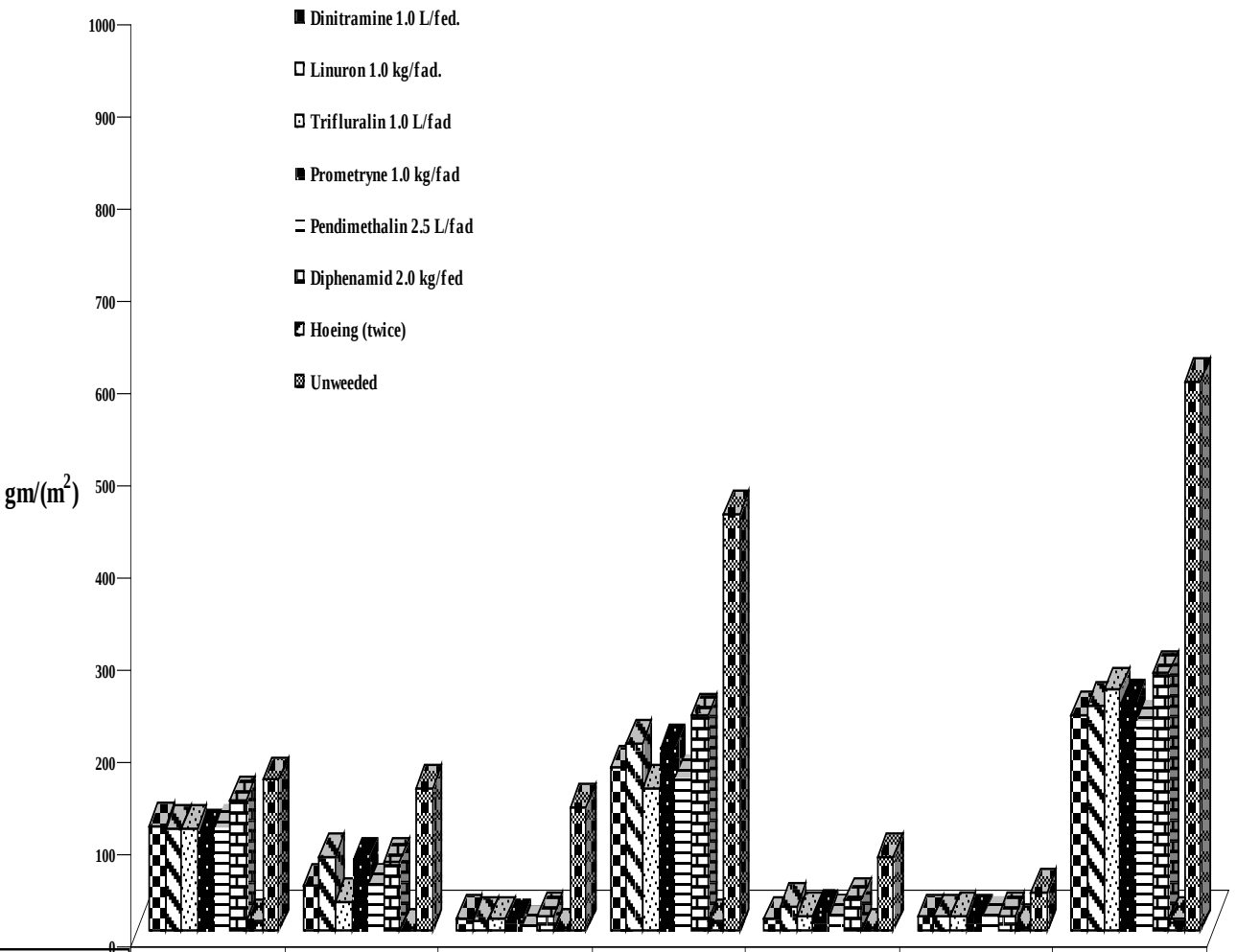
The available results revealed clearly that the fresh weights of weed species as well as their total fresh weight were significantly affected by weed control treatments. This hold fairly true for the two growing seasons at 30 and 60 days from sowing. The lowest total fresh weight was recorded with the two-hand weeding treatment which was significantly lower than other treatments under investigation. This finding was quite expected since the weed assessment was carried out after 5 days from the second hoeing Figures (1-4).

At 30 days from sowing, all herbicidal treatments reduced to different extents the total fresh weight of weeds, but differences between them were not great enough to reach the significant level. This hold fairly true for 1st and 2nd growing seasons.



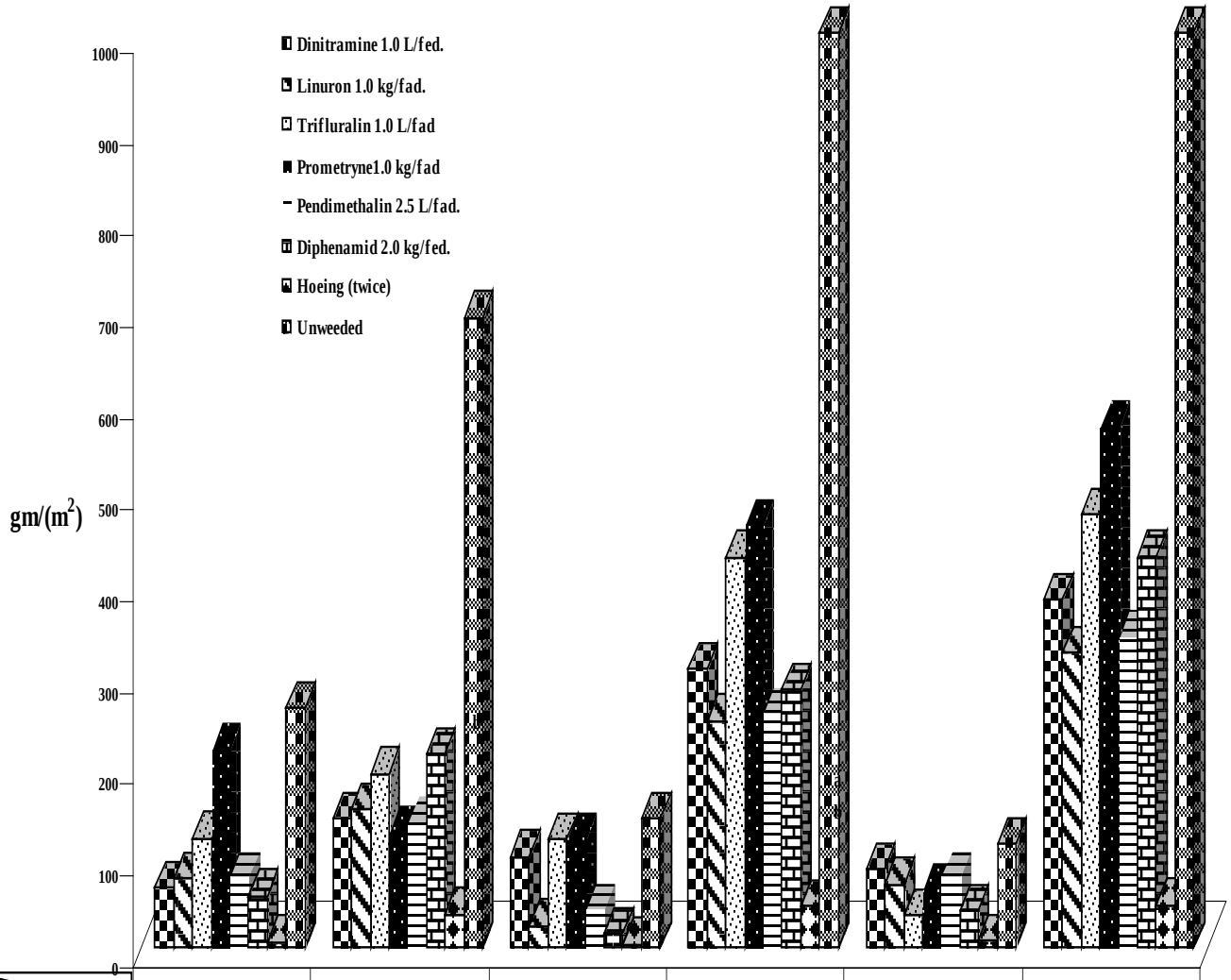
Treatment \ Weeds	Chenopodium murale,L.	Portulaca oleraceae,L.	Amaranthus caudatus,L.	Total broad- Leaved	Cyperussp.	Total fresh weight
Dinitramine 1.0L/fed.	28.67 ab	150.71 ab	35 a	214.38 bc	8.42 ab	261.42 b
Linuron 1.0kg/fad.	59.07 b	188.92 b	2.67 a	250.66 bc	13.05 c	267.51 b
Trifluralin 1.0L/fad	46.42 b	89.85 ab	39.64 a	175.91 b	12.67 b	196.37 b
Prometryne 1.0kg/fad	47.5 b	197.67 c	12.5 a	257.67 bc	12.14 b	275.71 b
Pendimethalin 2.5L/fad.	26.07 ab	245.17 c	4.28 a	275.52 c	14.1 c	301.42 b
Diphenamid 2.0kg/fed.	21.96 ab	136.42 ab	31.6 a	189.98 b	9.67 ab	206.92 b
Hoeing (twice)	2.21 a	48.03 a	0 a	50.24 a	2.16 a	56.14 a
Unweeded	358.21 c	434.17 d	154.7 b	947.08 d	19.53 d	1015.28 c

Figure 1 : Effect of weed control treatments on fresh weight of weeds after 30 days from sowing in 1st season (gm/m^2)



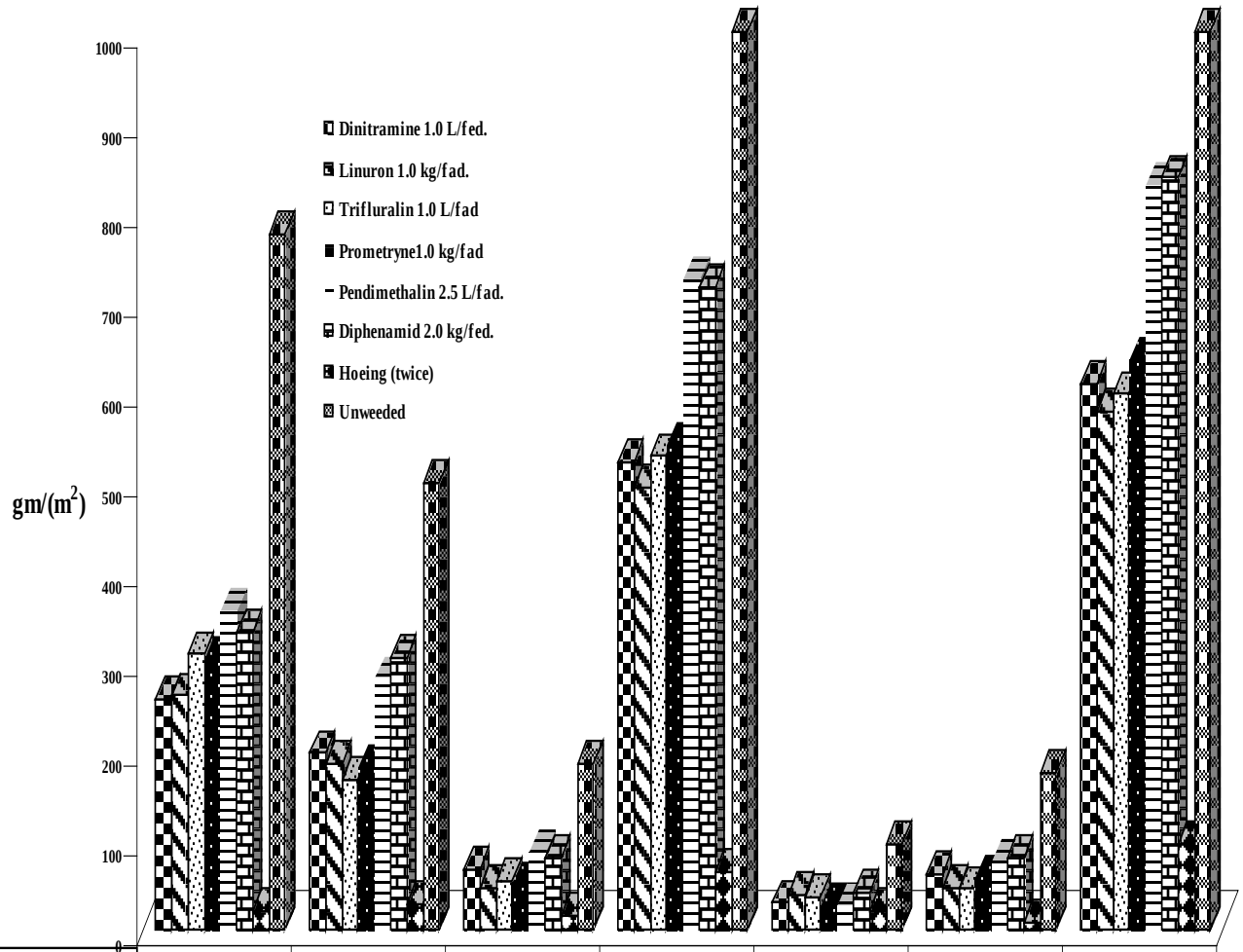
Treatment \ Weeds	Chenopodium murale,L	Beta vulgaris	Medicaga hispida	Total broad- Leaved	Echinochloa colonum,L.	Cyperussp.	Total fresh weight
Dinitramine 1.0 L/fed.	113.12 a	48.72 bc	14.35 b	176.19 b	12.49 b	15.71 b	234.36 b
Linuron 1.0 kg/fad.	111.23 a	79.97 c	11.86 b	203.06 b	26.84 c	15.51 b	244.97 b
Trifluralin 1.0 L/fad	110.6 a	31.22 b	12.88 b	154.7 b	16.87 c	16.96 b	260.6 b
Prometryne 1.0 kg/fad	108.75 a	79.34 c	13.12 b	201.21 b	21.87 c	16.42 b	249.34 b
Pendimethalin 2.5 L/fad	113.12 a	49.35 bc	4.92 b	167.39 b	16.87 c	15.56 b	227.49 b
Diphenamid 2.0 kg/fed	141.23 b	75 bc	16.24 b	232.47 b	33.6 c	16.96 b	278.73 b
Hoeing (twice)	10.5 a	0 a	0 a	10.5 a	0 a	4.21 a	12.48 a
Unweeded	163.26 b	154.35 d	134.36 c	451.95 c	81.23 d	42.67 c	594.97 c

Figure 2 : Effect of weed control treatments on fresh weight of weeds after 30 days from sowing in 2nd season (gm/m2)



Treatment \ Weeds	Chenopodium murale,L.	Portulaca oleraceae,L.	Amaranthus caudatue,L.	Total broad- Leaved	Cyperussp.	Total fresh weight
Dinitramine 1.0 L/fed.	65.17 ab	140.17 ab	98.57 ab	303.91 b	84.6 b	380.35 b
Linuron 1.0 kg/fad.	75 ab	150 ab	23.31 ab	248.21 b	69.1 b	322.67 b
Trifluralin 1.0 L/fad	118.75 b	190.17 ab	118.39 b	427.31 b	35.4 b	473.03 bc
Prometryne1.0 kg/fad	218.03 c	127.11 ab	118.75 b	463.89 b	63.35 b	570.89 c
Pendimethalin 2.5 L/fad.	76.78 ab	136.78 ab	42.85 ab	256.41 b	78.05 b	340.71 b
Diphenamid 2.0 kg/fed.	56.6 ab	210.89 b	14.46 a	281.95 b	39.05 b	426.6 bc
Hoeing (twice)	6.05 a	35.89 a	3.5 a	45.44 a	7 a	46.05 a
Unweeded	261.4 d	689.46 c	141.07 b	1091.93 c	112.25 b	1221.6 d

Figure 3 : Effect of weed control treatments on fresh weight of weeds after 60 days from sowing in 1st season (gm/m2)



Treatments \ Weeds	Chenopodium murale,L.	Beta vulgaris	Medicaga hispida	Total broad- Leaved	Echinochloa colonum,L.	Cyperussp.	Total fresh weight
Dinitramine 1.0 L/fed.	256.6 b	196.78 b	66.96 c	520.27 b	30.21 b	63.1 d	608.03 b
Linuron 1.0 kg/fad.	260.53 b	185.35 b	45.89 b	491.77 b	39.1 c	46.78 b	577.67 b
Trifluralin 1.0 L/fad	306.42 b	166.6 b	53.75 b	526.77 b	36.78 b	45.71 b	596.25 b
Prometryne1.0 kg/fad	304.28 b	182.8 b	53.03 b	540.11 b	28.03 b	59.64 c	636.25 b
Pendimethalin 2.5 L/fad.	356.42 b	281.07 c	87.03 e	724.52 c	29.64 bc	78.21 d	830.5 c
Diphenamid 2.0 kg/fed.	331.96 b	302.67 d	79.82 d	714.45 c	42.5 c	80 d	836.96 c
Hoeing (twice)	20.53 a	28.75 a	15.71 a	64.99 a	21.07 a	8.57 a	94.64 a
Unweeded	775 c	498.03 e	184.28 f	1457.31 d	94.46 d	175 e	1726.78 d

Figure 4 : Effect of weed control treatments on fresh weight of weeds after 60 days from sowing in 2nd season (gm/m^2)

These results are in agreement with those early reported by Dowler and Parker (1976), Salim (1982) and Moshtohry (1982).

Rohitshav *et al.* (2003) reported that pre-emergence application of pendimethalin 1.5 kg /ha produced soybean grain yields similar to weed free treatment. Rajput and Kushwah (2004) observed that pre-emergence application of pendimethalin at 1.0 kg/ha followed by one hand weeding at 30 days after sowing was the most profitable for controlling the weeds in soybean.

Concerning the effect of herbicidal treatments on present weed species, results revealed the following:

a) All herbicidal treatments reduced significantly the fresh weight of all weed species present in 1st and 2nd growing seasons if compared with the un weeded treatment.

   These results are in harmony with those obtained by Singh et al. (1973) Sanchez (1976) Baronova et al. (1975), Cruz et al. (1980) and amy et al. (2012)

b) No significant differences among the studied herbicidal treatments were recorded on the following weed species: *Chenopodium murale* L., *Amaranthus caudatus* L., and *Medicage hispida.*

   Abdel Raouf and Fayed (1978) stated that linuron at 1.5 kg/fad. gave the best control of broad-leaved weeds in soybeans, while Moshtohry (1982) reported that the depression in dry weight of soybean weeds amounted 43.01, 47.39, 47.78 and 84.53 % over the control for prometryne, prometryne + amex, prometryne + ronstar and hoeing treatments, respectively. Amex treatment had the lowest controlling effect on broad-leaved weeds.

c) The effect of herbicidal treatments on the fresh weight of *Beta vulgar* and *Portulaca oleraceae* L. varied greatly. The lowest fresh weight was obtained with trifluralin treatment while the highest was recorded with linuron and pendimethalin treatments, respectively.

   Sanchez, et al (1976) indicated that linuron application at a rate of 3.5 kg/ha. gave good control of *Portulaca oleracea*, while Doersch (1980) found that trifluralin at 0.75 1b/acre, and pendimethalin at 1.5 1b/acre, all incorporated pre-sowing gave 76% control of annual broad – leaved weeds .

d) The fresh weight of *Echinochloa colonum* L. was significantly reduced by weed control treatments. The lowest weight was obtained with hoeing followed by that of dinitramine treatment. Differences among the rest of the herbicidal treatments were not great enough to reach the level of significance. Fayed et al. (1983) reported that trifluralin and metribuzin at 1.0 + 0.5 kg/ha. gave the best selective control of grasses in soybean. But Doersch, (1980) Concluded that trifluralin at 0.75 lb/acre, and pendimethalin at 1.5 lb/acre, all incorporated pre-sowing, gave an average of 97% control of annual grasses.

Date presented in Figures (3and 4) showed the effect of weed control treatments on weed species after 60 days from sowing in 1st and 2nd growing seasons, respectively.

The available results indicated that the total fresh weight of weeds was significantly reduced by weed control treatments. The lowest fresh weight of the different weed species under investigation as well as their total fresh weight was recorded with the two-hand weeding treatments. This was true for the 1st and 2nd seasons.

Results also revealed that all herbicidal treatments affected to different extents the total fresh weight of weeds. The lowest fresh weight was recorded with linuron treatments which does not differ significantly from those treatments of dinitramine and trifluralin. The superiority of linuron treatment in 2nd could be attributed to its effective control of weed species. On the contrary, the highest fresh weight of weeds was recorded with prometryne and diphenamid treatments in 1st seasons and with diphenamid and pendimethalin treatments in the 2nd season.

These differences in the activity of herbicidal treatments under investigation from 1st to 2nd season is mainly attributed to the different responses of the different weed species present in the two seasons. Concerning the effect of the studied herbicidal treatments on the major weed species in the field plots could be summarized as follow :-

1. The effect of diphenamid or pendimethalin treatments on fresh weight of *Bate vulgaris, Medicage hispida* and *Echinochloa colonum*, L. were much lower than those of other herbicidal treatments. The decreases in fresh weight of *Beta Vulgaris* amounted 39.22 and 43.56% of the un weeded treatments due to diphenamid and pendimethalin treatments, respectively.
2. The lowest fresh weight of *Chenopodium murale* and *Amaranthus caudatus* L. weeds was recorded by diphenamid treatments which does not differ significantly from the hand weeding treatment. The decreases in their fresh weight amounted 78.34 and 89.74 % of the control treatment, respectively. On the contrary, the lowest controlling effect of *Chenopodium murale* and *Amaranthus caudatus* L. weeds was obtained by prometryne followed by that of trifluralin treatment.
3. Concerning the effect of herbicidal treatments on *Portulaca oleraceae*, results revealed no significant differences but diphenamid showed the lowest killing effect followed by tifluralin treatment.

b) Effect of plant distance on weeds

In both seasons, plant distance (density) showed significant effects on weed attributes assessed

after 30 and 60 days from sowing. Results in Table(5) indicated that higher fresh weight of weed species was recorded with the wider distance, between plants (lower plant density).

This hold fairly true for both seasons after 30 and 60 days from sowing for almost all weed species.

The dominant weeds were as follow in descending order; *Protulaca oleraceae,* L., *Chenopodium murale,* L. and *Amaranthus caudatus,* L. in 1st season and were *Chenopodium murale,* L. *Beta vulgaris* and *Medicago hispida* in 2nd season.

The reduction in fresh weight of the a above weed species due to narrow planting after 30 days from sowing amounted 27.09, 50.71 and 58.64% in 1st season and 25.83, 3.8 and 27.93 % in 2nd season.

Nice et al. (2001) found that increasing soybean populations from 245,000 plant/ha to 481,000 and 676,000 plants/ha coupled with reduced row spacing reduced sicklepod *(Senna obtusifolia* L.*)*

These results are in agreement with those obtained by Mcwhorter and Barrentine (1972), Gurnah (1978), Moshtohry (1982). and Guillermo (2009).

Table 5 : Effect of plant distance treatments on fresh weight of weeds (gm/m^2). After 30 and 60 days from sowing

Weeds	After 30days from sowing				After 60days from sowing			
	1st		2nd		1st		2nd	
	Distance (cm)							
	5*	10**	5*	10**	5*	10**	5*	10**
Chenopodium murale ,L.	48.11 a	97.61 b	92.25 a	124.38 b	94.59 a	123.34 b	268.39 a	357.63 b
*Portulaca oleraceae,*L.	160.21 a	219.75 b	–	–	186.33 a	210.08 b	–	–
Beta vulgaris	–	–	63.56 a	66.08 a	–	–	192.40 a	268.12 b
*Amaranthus Caudatus,*L.	23.43 a	56.66 b	–	–	68.30 a	93.98 b		
Medicago hispida	–	–	21.70 a	30.11 b	–	–	60.08 a	86.61 b
Total broad-leaved	231.75 a	374.02 b	177.51 a	220.57 b	349.22 a	427.40 b	520.87 a	712.36 b
Grass weed Echinochloa colonum	–	–	19.98 a	32.32 b	–	–	33.34 a	47.10 b
Perennials weed *Cyperus sp.*	12.85 a	10.08 a	15.38 a	20.63 b	52.41 a	69.80 b	63.20 a	92.94 b
Total fresh weight	287.46 a	367.78 b	243.41 a	321.07 b	422.14 a	522.14 b	611.12 a	860.36 b

*5 cm = 140000 plants/fad. ** 10 cm = 70000 plants/fad.

c) Effect of the interaction between weed control treatments and plant distance on weeds

Data presented in Figures (6-9) demonstrated the effect of the interaction between plant densities and weed control treatments on fresh weight of some weed species at two stages of growth in two growing seasons. Results in Fig (6) revealed clearly that the effect of weed control treatments under investigation on weeds was not the same at the two plants densities. Results also indicated that narrower plant density (5- cm between plants) always decreased the fresh weight of weed species. This last finding hold fairly true for all weed species but the response was not the same with the herbicidal treatments under investigation. At the narrow plant density, no significant differences were detected between hoeing, diphenamid and trifluralin treatments on fresh weight of *Portulaca oleraceae,* L, but the effect of these treatments at the wide distance between plants was great enough to reach the level of significance.

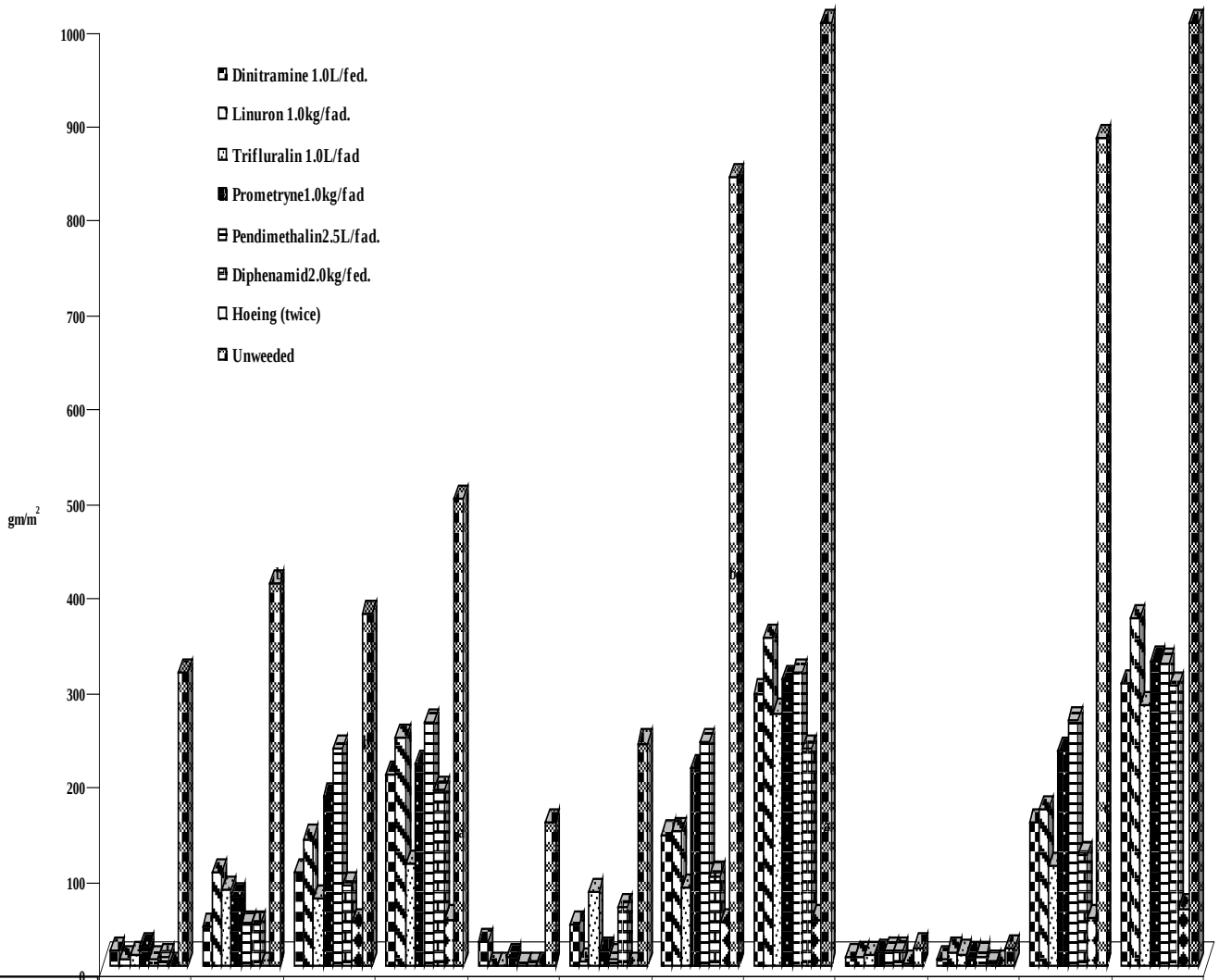
Similar responses could be illustrated with other weed species as well as with total fresh weight of the dominant weeds as shown in Figures 6 and 7.

The effect of the above interaction on fresh weight of weed species associated with soybean after 60 days from sowing are shown in Figures (8-9).

The obtained results indicated that the effect of weed control treatments on weed species was not the same under the two plant densities.

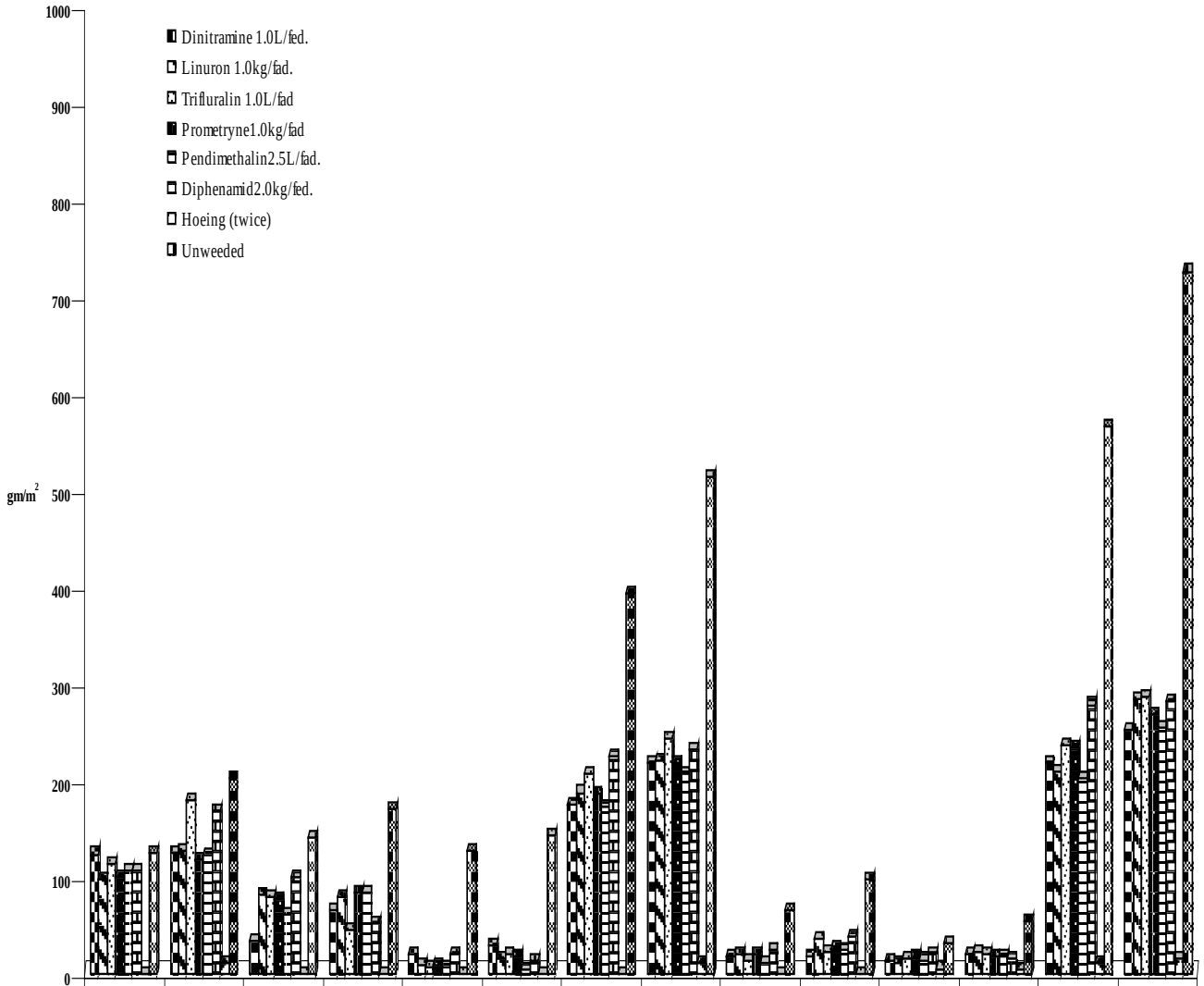
The effect of dinitramine, linuron and trifluralin on the fresh weight of *Amaranthus caudatus,* L. was the same at the wide distance between plants, but their effect was not the same under the narrow distance (fig 8).

It could be concluded that the significant effect of the interaction between weed control treatments and plant densities on weeds or weed species revealed that the behavior of weed control treatments was not the same at the different plant densities. This was true for the two growing seasons as well as for the different stages of growth.



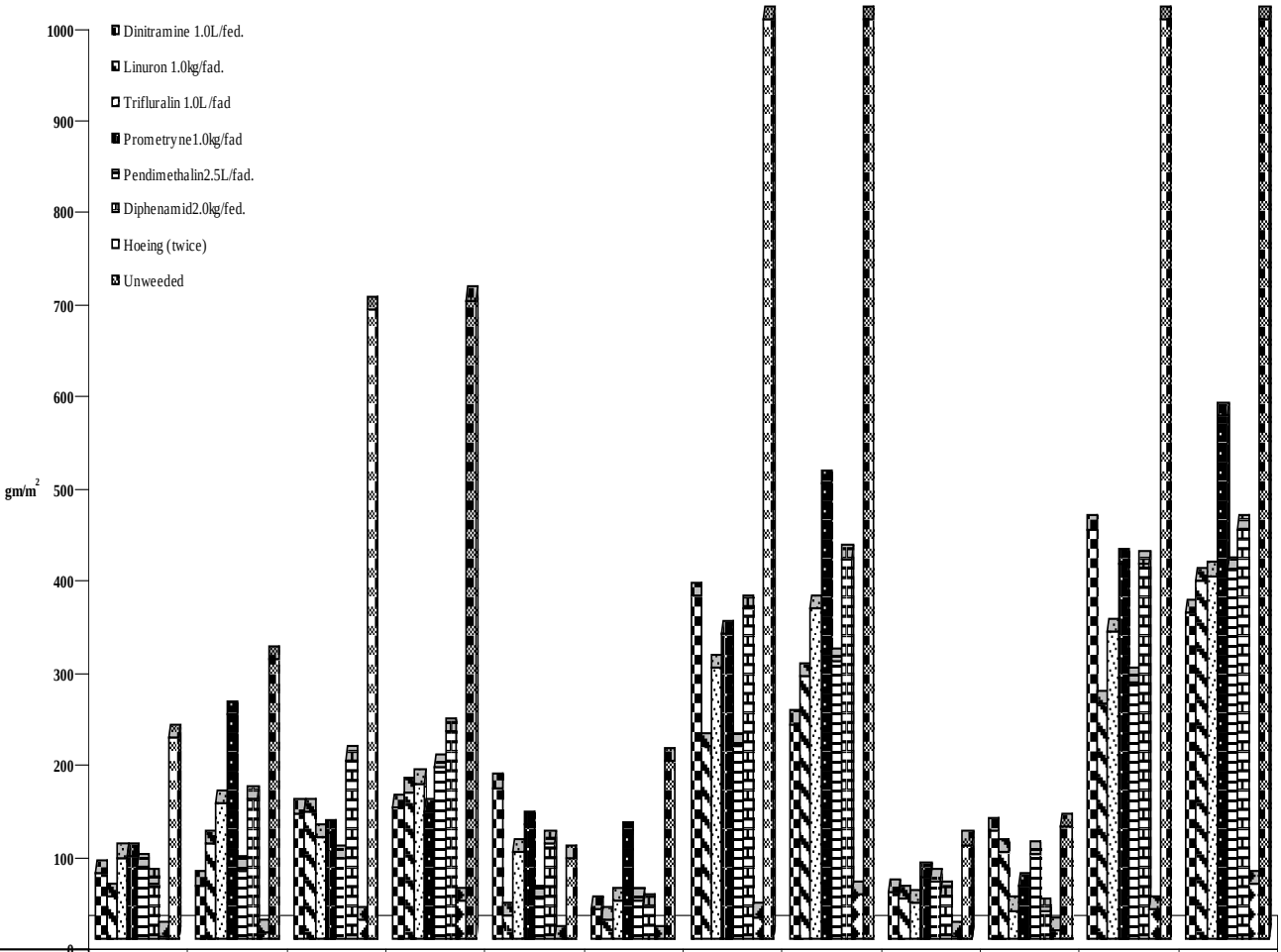
Weeds / Treatments	Chenopodium murale,L. 5cm	Chenopodium murale,L. 10cm	Portulaca oleraceae,L. 5cm	Portulaca oleraceae,L. 10 cm	Amaranthus caudatue,L. 5 cm	Amaranthus caudatue,L. 10cm	Total broad-leaved 5 cm	Total broad-leaved 10 cm	Cyperus sp. 5cm	Cyperus sp. 10 cm	Total fresh weight 5 cm	Total fresh weight 10 cm
Dinitramine 1.0L/fed.	15.71 a	41.64 a	98.57 b	202.85 cd	25.35 a	44.64 a	139.63 ab	289.13 bc	10.07 ab	6.78 b	152.8 a	299.85 b
Linuron 1.0kg/fad.	8.1 a	100.04 a	135.35 b	242.5 d	0 a	5.35 a	143.45 ab	347.89 c	10.75 ab	15.35 b	166.42 a	368.64 b
Trifluralin 1.0L/fad	11.42 a	81.42 a	71.78 ab	107.92 b	0 a	79.28 a	83.2 a	268.62 bc	12.14 ab	13.21 ab	106 a	276.78 a
Prometryne1.0kg/fad	20.71 a	74.28 a	180.35 d	215 cd	9.28 a	15.71 a	210.34 b	304.99 bc	13.57 ab	10.71 ab	227.5 b	323.92 b
Pendimethalin2.5L/fad.	7.85 a	44.28 a	229.81 d	258.57 d	0 a	8.57 a	237.66 b	311.42 bc	17.14 b	11.07 ab	261.42 b	321.78 b
Diphenamid2.0kg/fed.	10.4 a	43.71 a	85.35 ab	187.5 c	0 a	63.21 a	95.75 ab	231.21 bc	16.5 b	2.85 ab	117.07 a	296.78 a
Hoeing (twice)	0 a	0 a	46.07 a	50 a	0 a	0 a	46.07 a	50 a	2.9 a	1.41 a	51.07 a	61.21 a
Unweeded	310.71 b	405.71 b	373.57 e	494.78 f	152.85 b	236.57 c	836.42 d	1137.06 e	19.78 c	19.28 c	877.14 c	1153.42 a

Figure 6 : Effect of the interaction between plant distance and weed control treatments on fresh weight of weed species after 30 day from sowing in 1st season (gm/m^2)



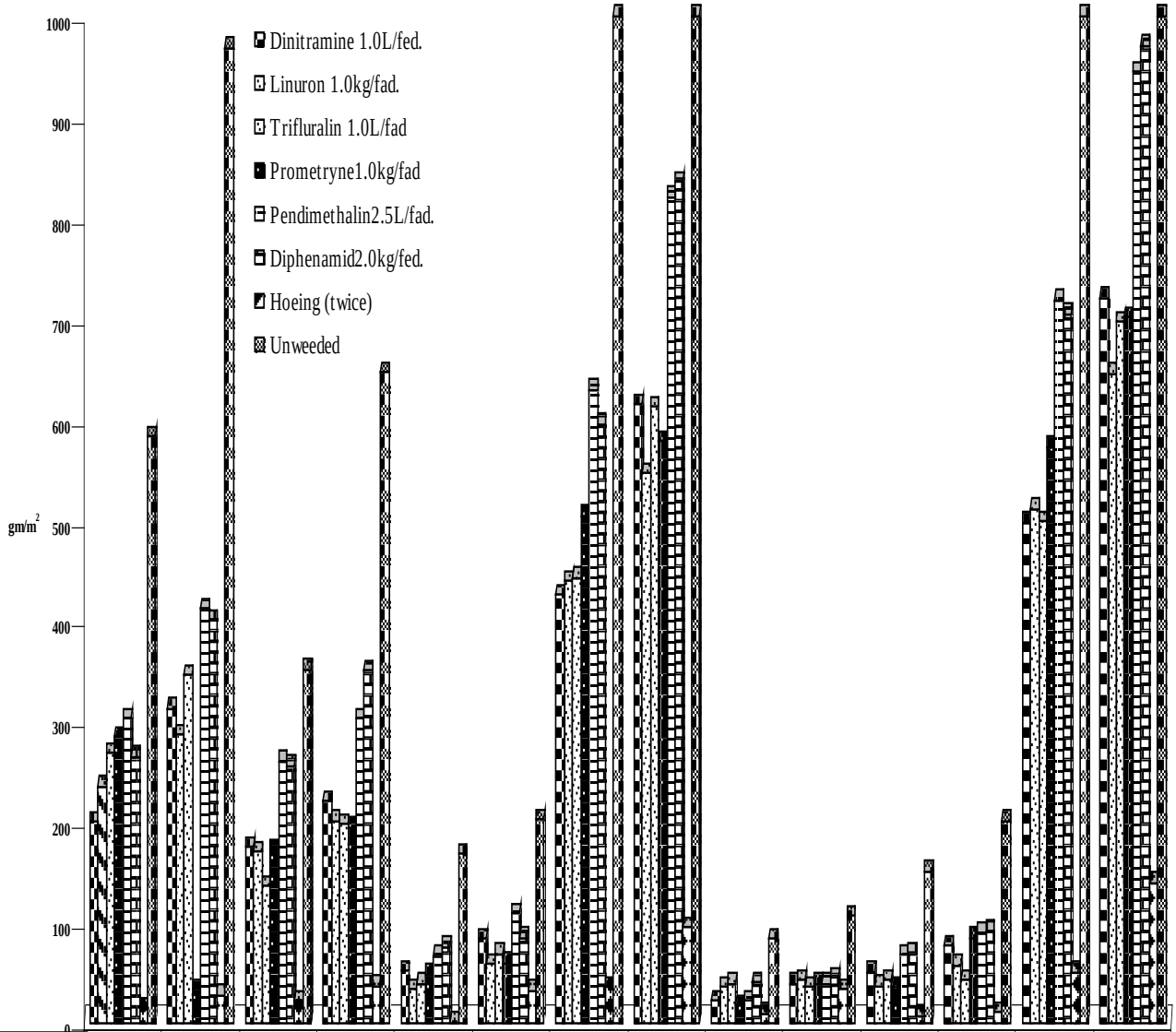
Weeds / Treatments	Chenopodium murale,L. 5 cm	Chenopodium murale,L. 10 cm	Beta vulgaris 5cm	Beta vulgaris 10 cm	Medicaga hispida 5 cm	Medicaga hispida 10 cm	Total broad-leaved 5 cm	Total broad-leaved 10 cm	Echinochloa colonum,L . 5 cm	Echinochloa colonum,L. 10 cm	Cyperus sp. 5cm	Cyperussp. 10 cm	Total fresh weight 5 cm	Total fresh weight 10 cm
Dinitramine 1.0L/fed.	122.9 a	123.34 a	32.48 bc	64.99 de	19.4 c	28.73 d	174.78 b	217.06 b	17.49 c	17.5 cd	12.5 ab	18.92 b	217.49 b	251.23 bc
Linuron 1.0kg/fad.	96.49 a	125.97 a	81.23 e	78.75 e	8.75 b	14.98 b	186.47 b	219.7 b	18.72 c	35 f	9.6 ab	21.42 b	207.47 b	282.47 c
Trifluralin 1.0L/fad	112.48 a	178.72 b	78.72 de	43.75 c	4.97 a	19.77 c	206.17 b	242.24 b	12.49 c	21.24 de	15.35 b	18.57 b	236.24 b	284.97 c
Prometryne1.0kg/fad	100 a	117.5 a	76.23 de	82.49 e	8.75 b	17.5 c	184.98 b	217.49 b	19.77 d	25.34 ef	16.07 b	16.78 b	232.47 b	266.25 bc
Pendimethalin2.5L/fad.	104.97 a	121.24 a	59.99 d	83.74 e	6.23 ab	3.74 a	171.19 b	204.98 b	11.48 c	23.34 de	13.92 ab	17.21 b	201.24 b	253.75 bc
Diphenamid2.0kg/fed.	106.23 a	166.23 b	99.9 f	51.24 cd	18.72 c	13.72 bc	224.85 b	231.19 b	24.99 ef	38.74 f	19.64 b	14.28 b	277.49 bc	279.97 bc
Hoeing (twice)	0 a	10.5 a	0 a	0 a	0 a	0 a	0 a	10.5 a	0 a	0 a	4.81 a	3.61 a	9.99 a	14.97 a
Unweeded	124.95 a	201.6 b	140 g	168.73 h	126.24 e	142.45 f	391.19 c	512.78 c	64.99 g	97.47 h	31.17 c	54.28 d	564.95 d	724.99 a

Figure 7 : Effect of the interaction between plant distance and weed control treatments on fresh weight of weed species after 30 day from sowing in 2nd season (gm/m2)



Weeds / Treatments	Chenopodium murale,L. 5cm	Chenopodium murale,L. 10 cm	Portulaca oleraceae,L. 5cm	Portulaca oleraceae,L. 10 cm	Amaranthus caudatue,L. 5 cm	Amaranthus caudatue,L. 10cm	Total broad-leaved 5 cm	Total broad-leaved 10 cm	Cyperusp. 5cm	Cyperussp. 10 cm	Total fresh weight 5 cm	Total fresh weight 10 cm
Dinitramine 1.0L/fed.	71.42 ab	58.92 ab	137.5 ab	142.85 ab	165 d	32.14 b	373.92 b	233.91 ab	50.8 ab	118.4 ab	446.07 bc	355 b
Linuron 1.0kg/fad.	46.42 ab	103.57 ab	139.28 ab	160.71 ab	25 b	21.42 b	210.7 ab	285.7 ab	43.6 ab	94.6 ab	256.07 b	389.28 bc
Trifluralin 1.0L/fad	89.28 ab	148.21 ab	110.71 ab	169.64 ab	95.71 c	41.07 b	295.7 ab	358.85 ab	39.21 ab	31.7 ab	335 b	395 c
Prometryne1.0kg/fad	91.07 ab	245 b	116.07 ab	138.21 ab	125 c	112.5 c	332.14 ab	495.71 b	68.4 ab	58.3 ab	408.92 bc	568.98 c
Pendimethalin2.5L/fad.	78.5 ab	75 ab	87.5 ab	186.07 ab	44.64 b	41.07 b	210.64 ab	302.14 ab	62.9 ab	93.2 ab	280.35 b	401.07 bc
Diphenamid2.0kg/fed.	61.42 ab	151.78 ab	195 ab	226.78 b	103.57 c	35.35 b	359.99 ab	413.91 ab	47.5 ab	30.6 ab	407.14 bc	446 bc
Hoeing (twice)	4.05 a	8.05 a	20.35 a	41.42 a	0 a	0 a	24.4 a	49.47 a	4.2 a	9.8 a	32.1 a	60 ab
Unweeded	218.52 b	304.28 c	684.28 c	694.64 c	87.5 c	194.64 e	1014.7 c	1193.56 c	102.7 b	121.8 b	1121.42 d	1321.78 d

Figure 8 : Effect of the interaction between plant distance and weed control treatments on fresh weight of weed species after 60 day from sowing in 1st season (gm/m^2)



Weeds / Treatments	Chenopodium murale,L. 5 cm	Chenopodium murale,L. 10 cm	Beta Vulgaris 5cm	Beta Vulgaris 10 cm	Medicaga hispida 5 cm	Medicaga hispida 10 cm	Total broad-leaved 5 cm	Total broad-leaved 10 cm	Echinochloa colonum ,L. 5 cm	Echinochloa colonum ,L. 10 cm	Cyperussp. 5cm	Cyperussp. 10 cm	Total fresh weight 5 cm	Total fresh weight 10 cm
Dinitramine 1.0L/fed.	199.64 b	312.5 d	174.28 c	219.28 d	51.42 e	82.5 I	425.34 b	614.28 b	21.42 ab	39 b	50.14 e	76.07 h	496.07 b	720 c
Linuron 1.0kg/fad.	235 bc	286.07 cd	170 c	200.71 d	33.57 b	58.21 f	438.57 b	544.99 b	35.71 b	42.5 b	36.42 c	57.14 e	510.71 bc	644.64 bc
Trifluralin 1.0L/fad	267.14 c	345.71 d	136.07 c	197.14 d	38.92 c	68.57 g	442.13 b	611.41 b	38.92 ab	34.64 b	41.78 d	41.78 d	497.85 b	695.71 bc
Prometryne1.0kg/fad	283.57 cd	32.5 d	171.78 c	193.92 d	47.85 d	58.91 f	503.2 ab	577.83 b	17.14 ab	38.92 b	34.64 c	84.64 s	571.78 bc	700.71 bc
Pendimethalin2.5L/fad.	302.14 cd	410.71 e	260 d	302.14 e	66.42 g	107.64 j	628.56 b	820.49 c	21.07 ab	38.21 b	67.5 j	88.92 I	717.21 c	943.92 d
Diphenamid2.0kg/fed.	263.9 c	400 e	255.35 d	350 e	75.35 h	84.28 I	594.6 b	834.28 c	40.35 b	44.64 b	68.57 j	91.42 I	703.57 bc	970.35 d
Hoeing (twice)	13.57 a	27.5 a	21.42 a	36.07 b	0 a	31.42 b	34.99 a	94.99 a	8.92 a	33.21 b	6.42 a	10.71 b	50.35 a	138.92 a
Unweeded	582.14 f	967.85 g	350.35 e	645.71 h	167.14 k	201.42 L	1099.63 d	1814.98 e	83.21 c	105.71 d	150 k	200 L	1344.42 e	2120.71 f

Figure 9 : Effect of the interaction between plant distance and weed control treatments on fresh weight of weed species after 60 day from sowing in 2nd season (gm/m^2)

References Références Referencias

1. **Abdel-Raof, M. S. and Fayed, M.T. (1978):** Influence of some pre-emergence herbicides on weed control and yield of soybean crop. Fac. of Agric., Ain shams Univ. Res. Bull. No. 817, 23p.
2. Amy E. Hoffner, David L. Jordan, Alan C. York, E. James Dumphy, and WesleyJ. Everman (2012) Influence of soybean (*Glycine max*) population and herbicide Program on palmer Amaranth (*Amaranthus Palmeri*) control, soybean yield, and economic return. International Scholarly Research Network doi:10.5402/947395
3. **Baranova, M. M.; Delikov, I. I., Beloshaphin, S.I. and Shatokhin, A. I. (1975)**: The efficiency of using herbicides in soybean crops in the Far East., Sibirskii vestnik sel'shokhaz. Ven. Nauki 5 (3); 58-62. (c.f. weed Abst. 26 (6): 1542, 1977).
4. **Chauhan, Y. S., Bhargava, M. K. and Jain, V. K., (2002),** Effect of herbicides on weeds and soybean. Indian J. Weed Sci, **34** (3&4): 213-216.
5. **Cruz, L. S. P. and Leiderman, L. (1980):** Weed control in soybeans with herbicide mixtures. Planta Daninha 1(1):13-17 .(c.f. weed Abst. 29 (7): 1945,1980)
6. **Doersch, H. E. and Teasdale, J. R. (1980),** performance of herbicide combinations for weed control in soybean. Weed control conference, 33: 67- 68. Dep. Agron Univ. Wiscosin Madison. (c.f. Weed Abst. 29 (9):2764).
7. **Dowler, C. C. and Parker, M.B. (1976):** Soybean weed control systems in two southern coastal Plain soils. Weed Sci. 23 (3): 198-202.
8. **Duncan, D. B. (1955):** Multiple range and multiple F. tests. Biometrics, 11: 1-42.
9. **Fayed, M. T., Olfat H. El-Bagoury and H.T. Al-Marsafy (1983)**: The effectiveness of numerous herbicides in soybean. Egyptian Society of Crop. Science. Proc. of the first conf. of Agron. (2): 289-678.
10. **Guillermo D. Arce, Palle Pedersen, and Robert G. Hartzler (2009):** Soybean seeding rate effects on weed management Weed Technology 23:17–22
11. **Guliqbal Singh, (2005),** Effect of Chemical and mechanical methods on weed management, growth and grain yield of Soybean. Indian J. Weed Sci; **37** (1&2): 131-132.
12. **Gurnah, A. M. (1978):** The effects of plant population, spacing and weeding on yields of soybeans. Proc. East African weed Sci. Conf. 6:85-89.
13. **Idapuganti, R.G., Rana, D. S. and Rajvir Sharma., (2005),** Influence of integrated Weed Management on weed control and productivity of soybean. Indian J. Weed Sci., **37** (1&2): 126-128.
14. **Kushwah, S. S. and Vyas, M. D., (2006),** Efficacy of herbicides against weeds in rainfed soybean under Vindhyan plateau of Madhya Pradesh. Indian J. Weed Sci., **38** (1&2): 62-64.
15. **Malik, R.S., Ashok Yadav and Malik, R. K., (2006)**, Integrated weed management in soybean. Indian J. Weed Sci., **38** (1&2): 65-68.
16. **Mcwhorter, C. G. and Barrentine, W.L. (1972):** Effect of methods of planting, seeding rate and use of different varieties on weed control in soybeans. Proc. Weed Sci. Soc. of America, 25: 54 -58.
17. **Moshtohry, M. R. (1982):** Weed control in soybean under some agronomic practices. Ph. D. Thesis, Fac. of Agric (Agronomy) Zagazig Univ.
18. **Nice, G. R., N. W. Buehring, and D. R. Shaw. (2001)**. Sicklepod (Senna obtusifolia) response to shading, soybean (Glycine max) row spacing, and population in three management systems. Weed Technol. 15:155–162.
19. **Pandya, N., Chouhan, G. S. and Nepalia, V., (2004)**, Effect of varieties, crop geometries and weed management practices on weed growth and grain yield of soybean. Indian J. Weed Sci., **36** (3&4): 203-206.
20. **Rajput, R. L. and Kushwah, S. S., (2004),** Integrated weed management in soybean on farmersfield. Indian J. Weed Sci., **6**(3&4): 210-212.
21. **Rohitashav Singh, Govindra Singh and Mahendra Singh., (2003),** Bio-efficacy of acetochlor for weed control in soybean. Indian J. Weed Sci., **35** (1&2): 67-69.
22. **Salim, A. A. (1982)**: weed control in soybean and its related problems. Ph.D. Thesis, Fac. Agric. Zagazig Univ.
23. **Sanchez, Marco, J., Delgado, I. (1976):** Experiments with herbicides in soybeans Saragossa 3 pp.Spain. (c. f. Weed Abst. 27 (7):2152, 1978).
24. **Singh, J. N.; Kirti Kumar, K. and Pandito, M. L. (1973)**: Herbicidal control of weeds in peas. Indian J. of weed Sci. 5 (1): 42 - 47.
25. **Snedecor, D. M., and Cochran, W.B. (1967):** Statistical analysis methods 6th edition. Iowa State Univ. Press Ames, Iowa, U.S.A.