RESULTS & DISCUSSION

IV- RESULTS AND DISCUSSION

IV-1-1 Effect of different soil management systems on weed control: -

The growing weeds in Anna apple orchard during the two experimental seasons were:

A – Broad leaved weeds, e. g .***Convolvulus ovevenisis*** (Bind weed or morning glory). ***Solanium nigrum*** (Black nightshade). ***Chenopodium SP.*** (Lomb's quarter) and ***urtica urens*** (small nettle).

b- Grassy weeds, e,g . ***cyperuse rotundus*** (Nutgrass) and ***cynodon doctyoln*** (Bermuda grass) .

IV- 1- A Broad leaved weeds: -

Data tabulated in Table (1) and illustrated in Fig (1) disclosed that mulching by black polyethylene treatment was more effective in decreasing weeds growth since it decreased significantly dry weight of broad leaved weeds. Moreover, herbicides and hand hoeing treatments were less effective than mulching by black polyethylene treatment in descending order.

Concerning Diuron 2% treatment was more effective than Gesaprem 2% and Round up 2% in decreasing dry weight of broad weeds during 1998 and 1999 seasons.

Refereeing to Hand hoeing treatment it is obvious that include decreasing dry weight of broad weeds compared with the control during 1998 and 1999 seasons.

Table (1) Effect of different soil management systems on dry weight (g/m^2) of broad leaved weeds in Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons:

Treatments	Broad leaved dry weight (g/m^2)	
	1998	1999
*Control	25.00 A	24.07 A
Hand hoeing	7.50 B	6.03 B
Round up 2%	4.80 D	5.05 C
Diuron 2%	3.47 E	3.00 D
Gesaprem 2%	6.30 C	5.67 B
Mulching by Black polyethylene	1.96 F	1.37 F

(Control) without weed control.

Means followed by the same letter within each column for each category are not significantly different from each other at 5% level.

IV-1-b – Grassy weeds: -

Data presented in Table (2) and Fig (2) indicated that mulching by black polyethylene treatment was more effective in decreasing grassy leaved weeds. Most herbicides and Hand hoeing treatments were effective than mulching by black polyethylene treatment

Concerning herbicides used in this study, it was found that Round up herbicide was more effective than Diuron and Gesaprem herbicides in decreasing dry weight of grassy weeds.

Refereeing to Hand hoeing treatment it is clear that it statistically reached the highest effect in decreasing dry weight of grassy leaved weeds compared with the control during 1998 and 1999 seasons .

Generally, the above mentioned results indicated that mulching by black polyethylene treatment was more effective in either broad or grassy weed control than the other soil management system used under this study.

These results are in general agreement with the findings of ***Young (1983), Gut et al (1991) , Marks , (1993) and Fatemah (1999*** . (They recommended the use of straw mulching use considered very effectiva for controlling weeds in most fruit crops orchards .

IV – 2 - Effect of different soil management systems on vegetative growth:

IV- 2 – 1- Number of shoots per branch: -

Regarding the number of shoots per branch of Anna apple trees, (Table 3 and Fig. 3) it could be noticed that mulching by black polyethylene treatment gave the highest values compared with

Table (2): Effect of different soil management systems on dry weight (g/m^2) of grassy weeds in Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons :

Treatments	Grassy dry weight (g/m^2)	
	1998	1999
*Control	84.70E	84.33 A
Hand hoeing	15.23 D	13.13 D
Round up 2%	9.80 E	10.10 D
Diuron 2%	50.07 B	48.52 B
Gesaprem 2%	25.00 C	26.13 C
Mulching by Black polyethylene	4.98 F	3.40 E

(control) without weed control.

Means followed by the same letter within each column for each category are not significantly different from each other at 5% level.

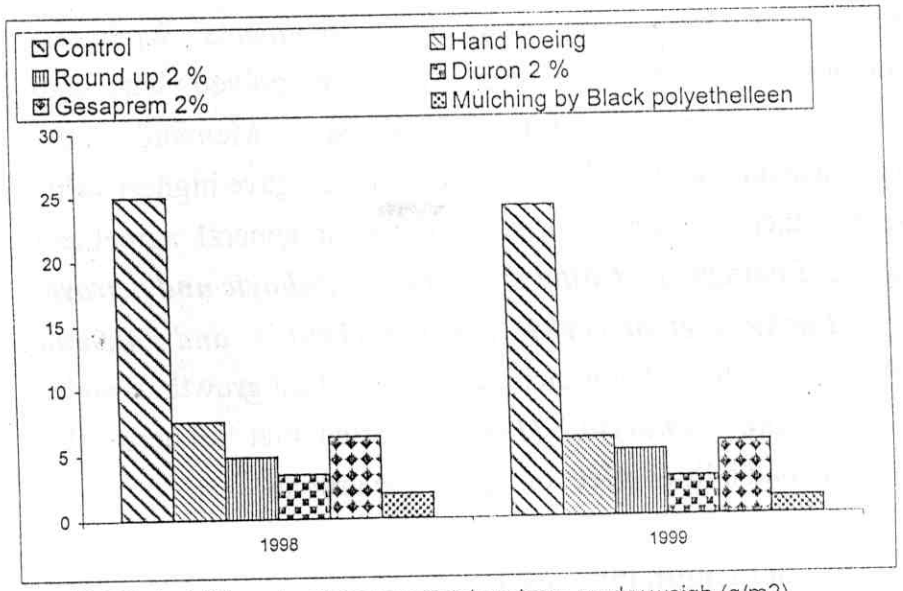

Fig (1) Effect of different soil management systems on dry weigh (g/m2) of broad leaved weeds in Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons.

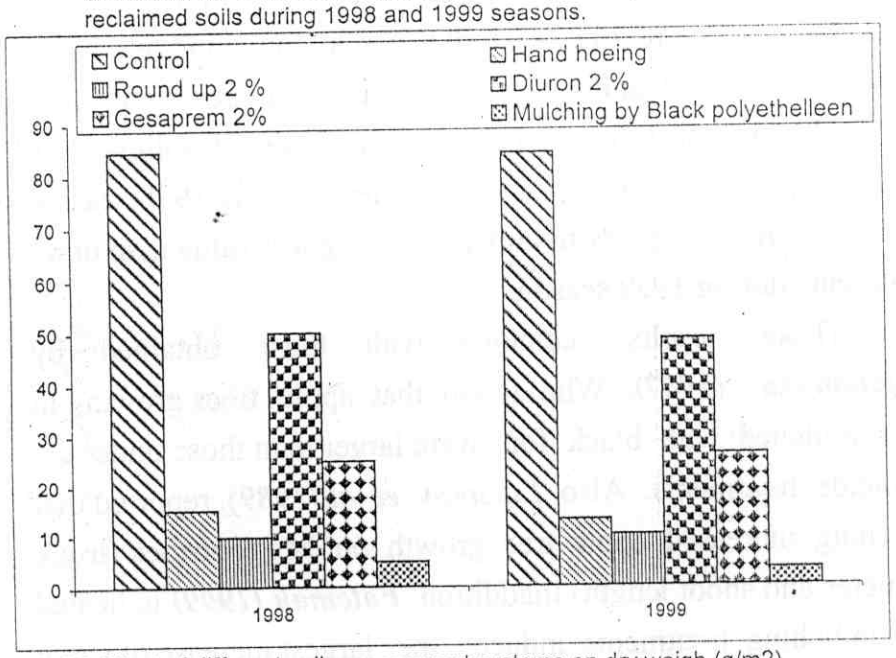

Fig (2) Effect of different soil management systems on dry weigh (g/m2) of grassy weeds in Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons.

hand hoeing, Round up and Diuron treatments. While, no differences between mulching by black polyethylene and Gesaprem in this respect during the first season, Menwhile in the second season mulching by black polyethylen gave highest value than the other treatments. These results are in general agreement with the findings of ***Chiba et al (1475), Rahovic and petrovic (1977) Luchkov et al (1989) , Ruger (1991) and Fatemah (1999)*** who found that mulching gave the best growth. Besides ***Johanson and Samuelson (1990)*** reported that all herbicides treatments had a littel effect on apple tree growth.

IV-2 –2 Shoot length increase (cm):

Concerning shoot length increase (cm) of Anna apple trees, Table (3) and Fig (4) indicate that mulching by black polyethylene significantly surpassed the other treatments used this study in their effect on increasing shoot length followed by Round up 2% and Diuron 2% treatments during 1998 season. Moreover, Round up 2% treatment gave highest value than other treatments during 1999 season.

These results coincide with those obtained by ***Stojanowska (1987).*** Who found that apple trees growing in rows mulched with black foil were larger than those under the herbicide treatments. Also ***Luchkov et al (1989***). reported that mulching increased apple tree growth on Mg rootstock (trunk diameter and shoot length) Inaddition ***Fatemah (1999)*** indicated that mulching treatments induced the largest increase of shoot length of Anna apple trees.

Table (3) :Effect of different soil management systems on vegetative growth of Anna apple trees growing up new reclaimed soil during 1998 and 1999 seasons.

Treatments	No. of shoots/ Branch		Shoot length increase (cm)		Leaf area (cm^2)	
	1998	1999	1998	1999	1998	1999
• control	10.47D	10.42D	15.89D	14.75C	26.00E	26.47C
Hand hoeing	12.40C	12.60C	17.90C	19.85AB	27.14D	27.54BC
Round up2%	12.80C	13.37C	21.60AB	21.40A	28.65C	29.68AB
Diuron 2%	15.03B	14.97B	19.01C	17.45B	30.87B	29.23B
Gesaprem 2%	15.97AB	13.28C	20.93B	17.60B	31.50AB	31.90A
Mulching by black polyethylene	16.84A	16.42A	22.97A	19.55AB	32.40A	31.90A

• Control without weed control.

Means followed by the same letter within each column for each category are not significantly different from each other at 5% level.

IV-2-3- Leaf area: -

Concerning leaf area, it is clear from Table (3) and Fig (5) that mulching treatment generally increased leaf area over the other treatments used under this study, On the other hand, no significant differences between mulching and Gesaprem in this respect during 1998 and 1999 seasons .

These results are in general agreement with the findings of ***Helail (1981)*** Who reported that mulch treatment induced the largest increase in leaf area of Washington navel.

In addition, ***Fatemah (1999)*** reported that mulching treatments induced largest increase in leaf area of Anna apple trees.

IV- 3 - Effect of soil management system on leaf nutrient contents (percentages and ppm)

It is found from Table (4a,b) and Fig. (6:13) that mulching by black polyethylene treatment led to increase leaf Mg, Ca and Fe contents while, was intermediate in leaf P, K, Zn, and Mn contents. On the other hand herbicide treatments was responsible for increasing leaf content of N, P, Mg Ca, Fe, Zn, and Mn especially Round up 2% and Gesaperm 2% while, Hand hoeing and un weeded control failed to increase leaf N, P, K, Mg, Ca, Fe, Zn and Mn .

These results are in general agreement with the findings of ***Tolhurst (1473), Helail (1981) and Mustaffa (1988)*** they found that mulch treatments increased leaf N, P, K, Ca, Mn and Mg contents. In addition, ***Bristol (1980)*** reported that leaf N, P and K contents were lower with mechanical weed control Also ***Hudska (1990)*** concluded that leafl K and Mg contents

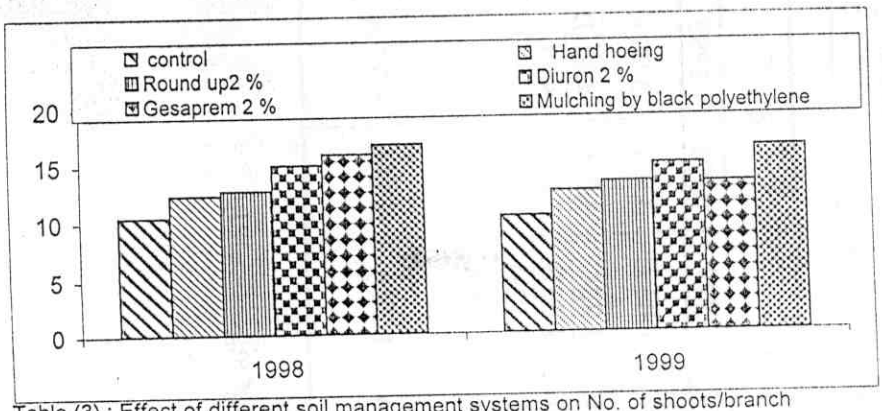

Table (3) : Effect of different soil management systems on No. of shoots/branch branch of Anna apple trees grown up in new reclaimed soil during 1998 and seasons

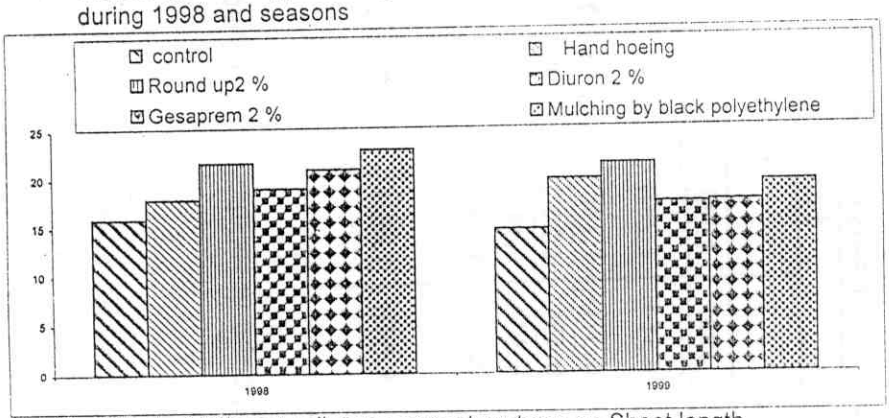

Fig (4) : Effect of different soil management systems on Shoot length increase(cm) of Anna apple trees grown up in new reclaimed soil during 1998 and seasons

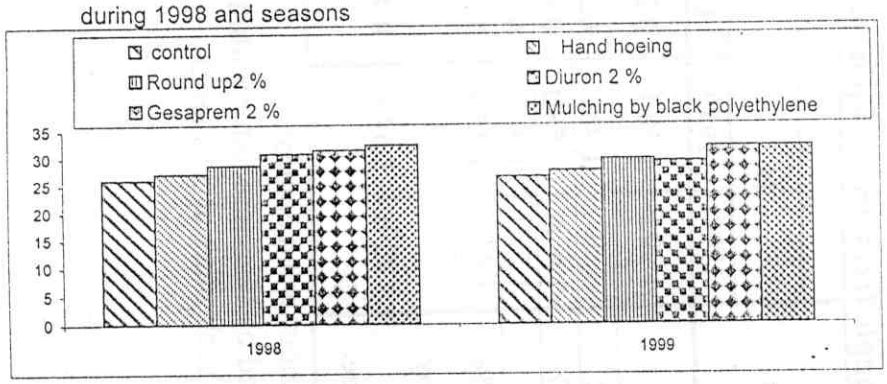

Fig (5) : Effect of different soil management systems on Leaf area $(cm)^2$ of Anna apple trees grown up in new reclaimed soil during 1998 and seasons

Table (4: a): Effect of different soil management systems on macro-nutrients content of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons

Treatments	Percentage									
	N		P		K		Mg		Ca	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
* Control	1.20 F	1.28 E	0.29 E	0.31 E	1.20B	1.30 C	1.01 E	1.03 E	3.97C	3.98 E
Hand hoeing	1.5C	1.48C	0.34D	0.37D	1.13C	1.16 D	1.20C	1.23C	4.09C	4.01 D
Round up 2 %	1.6 A	1.58B	0.40C	0.43C	1.24B	1.33 B	1.35B	1.33B	3.89C	3.93 F
Diuron 2 %	1.55B	1.56B	0.72A	0.80A	0.99 E	0.99 F	1.08D	1.12D	5.27B	5.01 C
Gesaprem 2 %	1.42B	1.35D	0.33D	0.35D	1.33A	1.40 A	1.30B	1.38A	5.52A	5.70 B
Mulching by black Polyethylene	1.23 E	1.64A	0.46B	0.54B	1.08D	1.09 E	1.43A	1.38A	5.53A	5.77 A

• Control without weed control.

Means followed by the same letter within each column for each category are not significantly different from each other at 5 % level .

Table (4: b): Effect of different soil management systems on micro-nutrients content of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons

Treatments	Part per million (P.P.M.)					
	Fe		Zn		Mn	
	1998	1999	1998	1999	1998	1999
* Control	120.17 F	122.20 D	29.53 F	30.30 F	25.57 F	25.13 E
Hand hoeing	135 .88 D	139.10 C	39.3 E	39.80 E	33.6 E	33.20 D
Round up 2 %	142.83 C	139.08C	85.27 A	84.38 A	64.81A	61.40 A
Diuron 2 %	159.57 B	163.28 B	44.38 D	60.53 B	42.44C	40.06 C
Gesaprem 2 %	131.56 A	171.29 A	59 .96 B	45.27 D	55.08B	54.69 B
Mulching by black Polyethylene	171 .34A	174.24 A	49.66 C	50.38 C	40.95D	40.95 C

- Control without weed control.

Means followed by the same letter within each column for each category are not significantly different from each other at 5 % level .

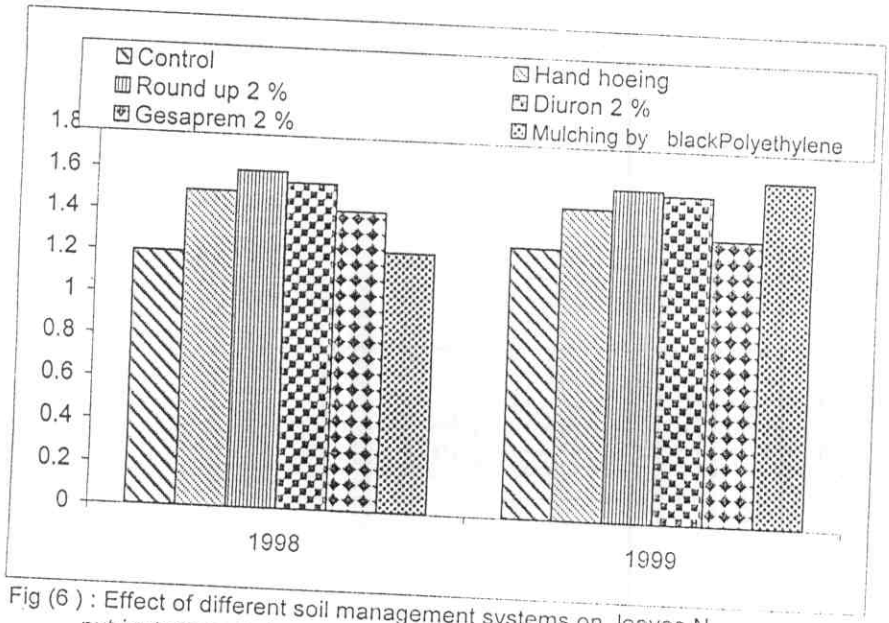

Fig (6) : Effect of different soil management systems on leaves N nutrient contents (percentage) of Anna apple trees growing up new reclaimed soils during 1998 and 1999 seasons

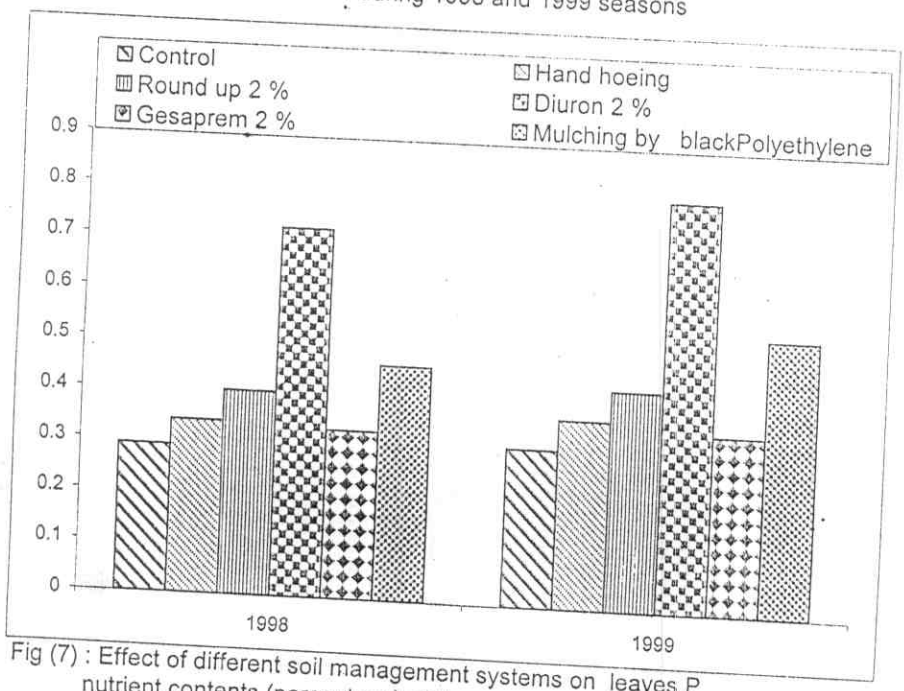

Fig (7) : Effect of different soil management systems on leaves P nutrient contents (percentage) of Anna apple trees growing up new reclaimed soils during 1998 and 1999 seasons

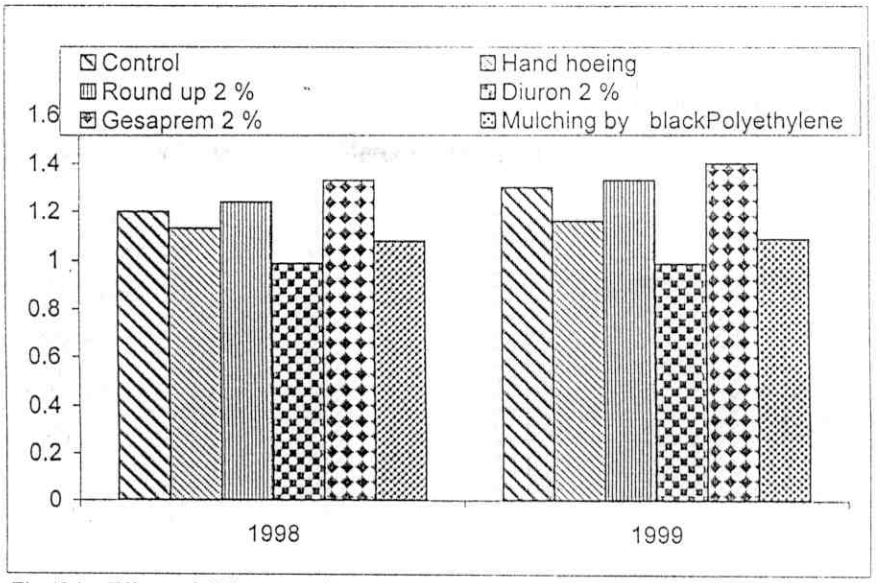

Fig (8) : Effect of different soil management systems on leaves K nutrient contents(percentage) of Anna apple trees growing up new reclaimed soils during 1998 and 1999 seasons

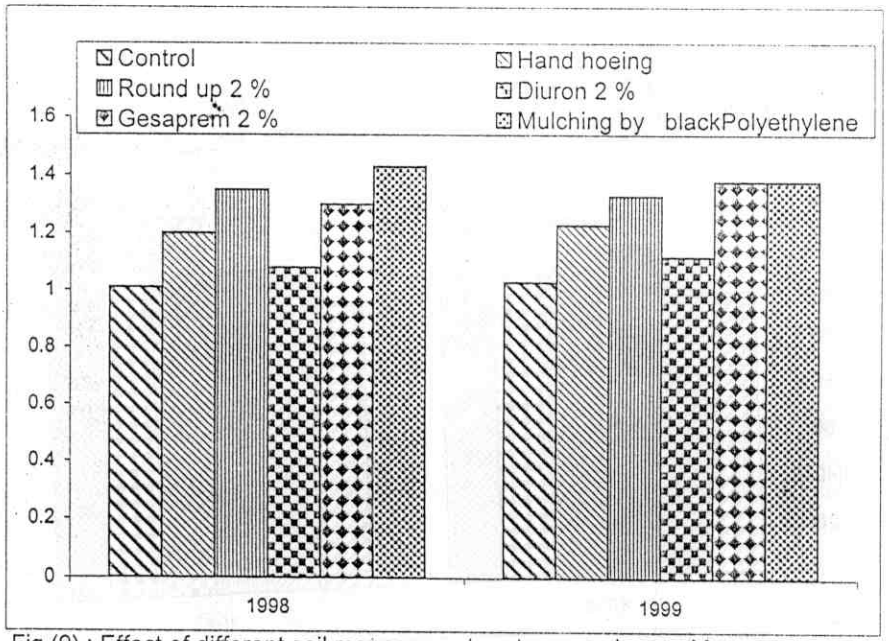

Fig (9) : Effect of different soil management systems on leaves Mg nutrient contents (percentage) of Anna apple trees growing up new reclaimed soils during 1998 and 1999 seasons

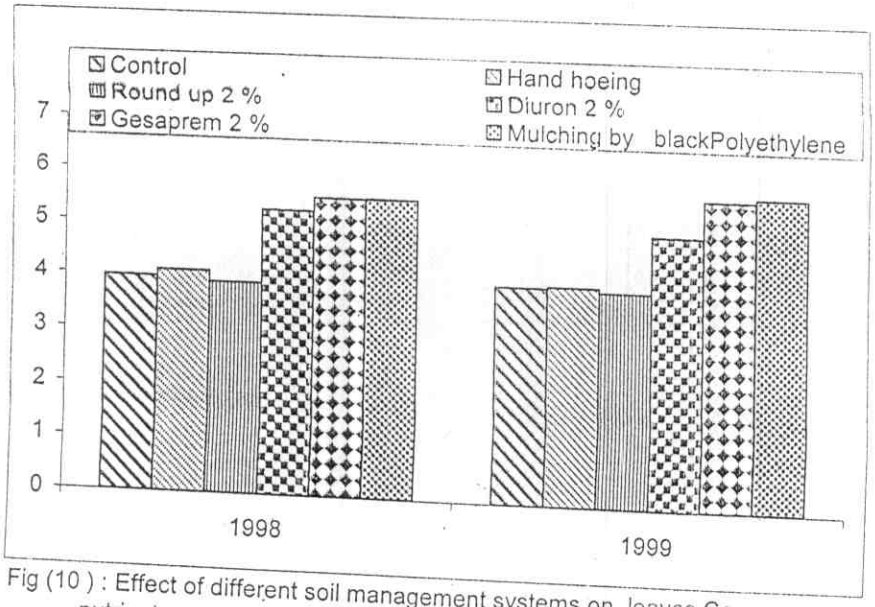

Fig (10) : Effect of different soil management systems on leaves Ca nutrient contents (percentage) of Anna apple trees growing up new reclaimed soils during 1998 and 1999 seasons

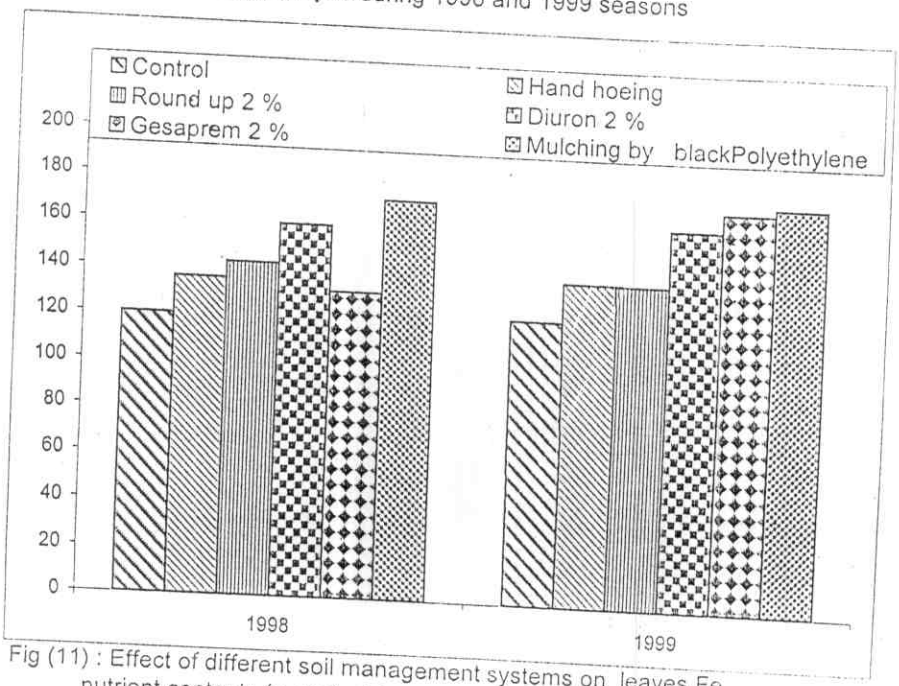

Fig (11) : Effect of different soil management systems on leaves Fe nutrient contents (p.p.m) of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons

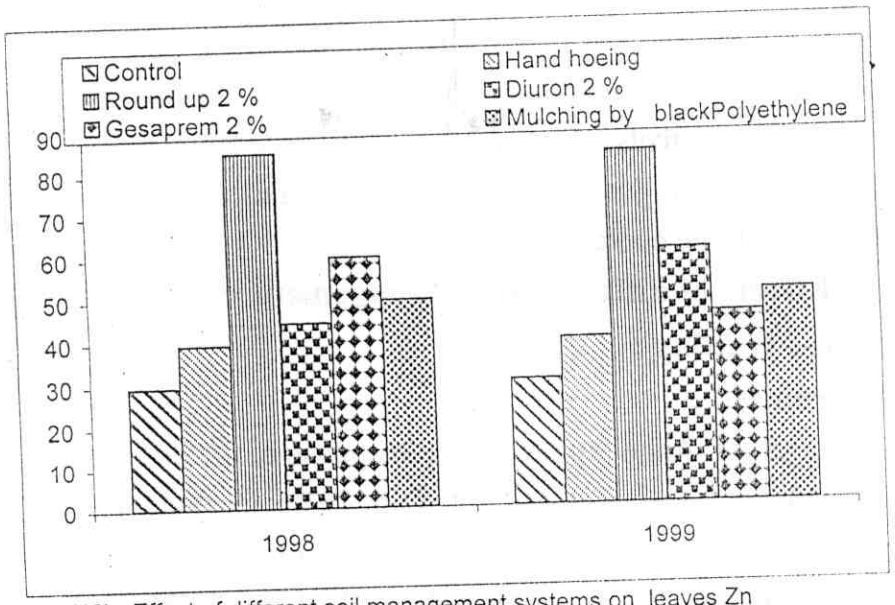

Fig (12) : Effect of different soil management systems on leaves Zn nutrient contents (p.p.m) of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons

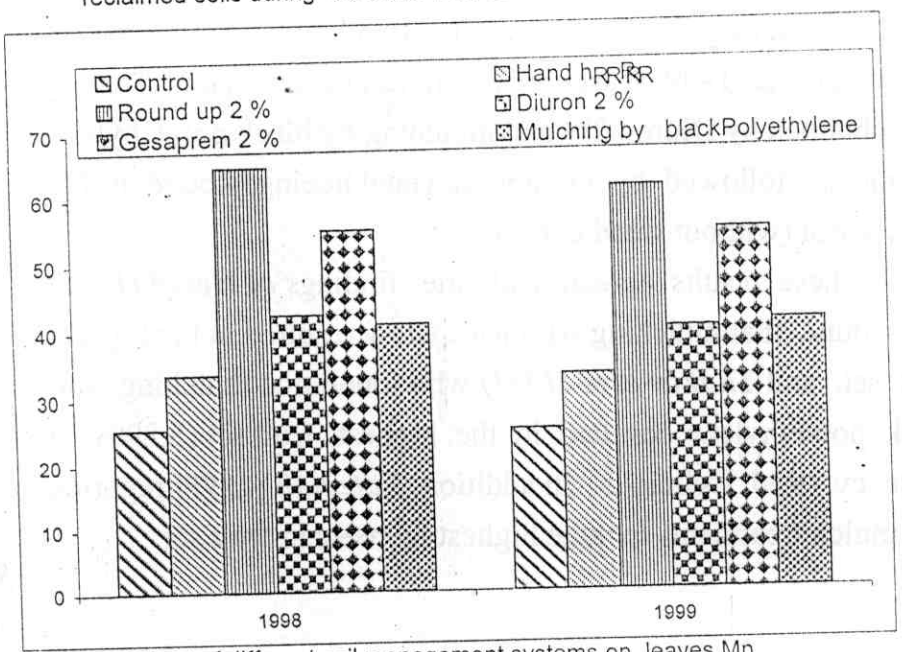

Fig (13) : Effect of different soil management systems on leaves Mn nutrient contents (p.p.m) of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons

increased in the plots of apple and some stone fruits trees treated with mulch.

Besides, ***Fatemah (1999)*** found that herbicide treatments increased leaf P, Ca and Fe contents while failed to increase leaf N, Zn, and Mn contents. On the other hand, Rice straw mulch succeeded in increasing leaf N, K and Zn, while faile to increase leaf P, Ca, Mg and Fe contents.

IV –4 - Effect of different soil management systems on tree fruiting :

IV-4 –1- Fruit set:

Fruit set of Anna apple trees in response to the different soil management systems is presented in Table (5 a) and Fi g (14). It is clear that, the highest percentage of fruit set was obtained by Diuron 2% as compared to all other treatments, followed by Hand hoeing and mulching by black polyethylene treatments during 1998 season. The trend was similar in this respect during .1999 season. The highest percentage of fruit set was obtained by Diuron 2% and mulching by black polyethylene treatments, followed by Gesaprem, Hand hoeing, Round up 2% and control (without weed control).

These results agreed with the findings ***of Helail (1981)*** who found that mulching with Rice straw resulted in the highest fruit set, and ***Thakur et al (1993)*** who found that mulching with black polyethylene resulted in the highest fruit set (8.89%) in apple cv, Red Delicious. In addition, ***Fatemah (1999)*** reported that mulch treatments include highest increase in fruit set.

Afalon's. Herbicide treatment was more preferable in increasing fruit set of Anna apple trees.

IV –4-2 - Fruit drop :-

It is clear from the data in Table (5 a) and Fig. (15) that mulching by black polyethylene decreased fruit drop percentage followed by Diuron 2% treatment. While, control (without weed control) increased fruit drop percentage during (1998) and (1999) seasons. On the other hand, Hand hoeing, Round up 2% and Gesaprem 2% treatments were varied statistically compared with the ather treatments in this respect.

These results arein agreement with the findings ***of Helail (1981)*** who found that mulching with rice straw lowered fruit drop of young Washington navel oranges fruits .Also ***Thakur et al (1993)*** found that mulching with black polyethylene resulted in lowest fruit drop in apple cv. Red Delicious. Besides, ***Fatemah (1999)*** .reported that both mulching and Afalon's herbicide treatments decreased fruit drop of Anna apple trees .

IV- 4- 3- Yield: -

Yield of Anna apple trees is expressed in Table (5 b) and Fig. (16,17) as kg and number of fruits per tree. It is well noticed that Diuron 2% treatments gave significantly the highest yield compared with Hand hoeing and control (without weed control) treatments. However, no significant difference was noticed between mulching by black polyethylene and Gesaprem 2% treatments .

Table (5 a): Effect of different soil management systems on fruit set and fruit drop percentages of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons .

Treatments	Fruit set %		Fruit drop %	
	1998	**1999**	**1998**	**1999**
*** Control**	16.85 D	20.27 B	86 .57 A	85.53 A
Hand hoeing	21.95 B	21.83 B	84.67 A	83.90 A
Round up 2 %	20.38 C	21.20 B	80.87 AB	83.79 A
Diuron 2%	23.30 A	25. 38 A	73.20 C	77.37 B
Gesaprem 2%	20.27 C	21.95 B	75.87 BC	75.80 B
Mulching by black polyethylene	21.50 BC	24 .93 A	70.87 C	73.61 B

Control without weed control .

Means followed by the same letter within each column for each category are not significantly different from each other at 5 % level.

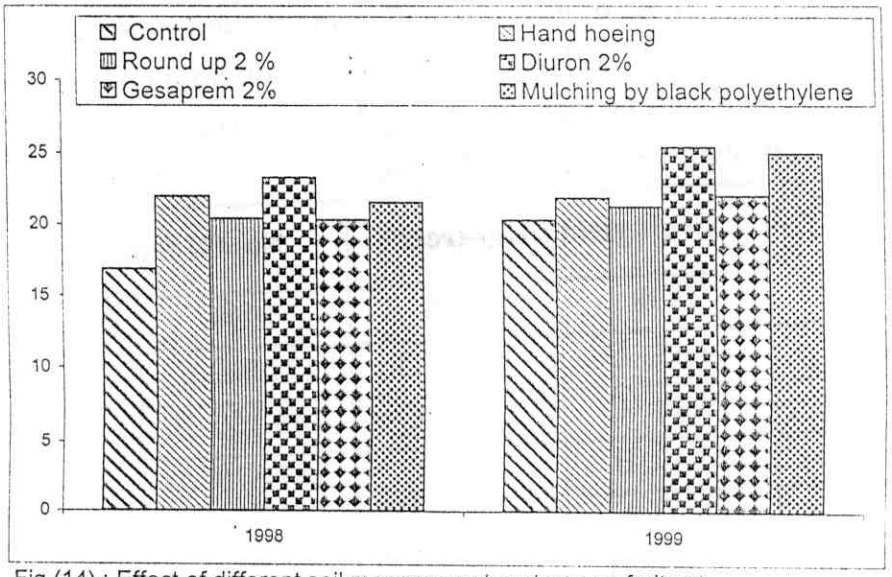

Fig (14) : Effect of different soil management systems on fruit set percentage of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons .

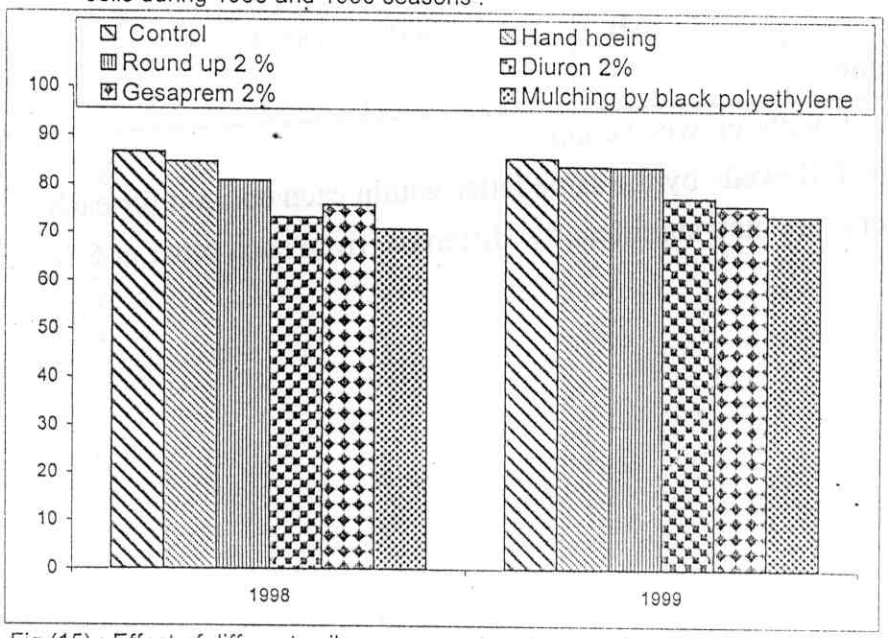

Fig (15) : Effect of different soil management systems on fruit drop percentage of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons .

Table (5, b): Effect of different soil management systems on fruit yield (Kg / Tree) and fruit No. per tree of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons .

Treatments	Fruit yield (Kg/ tree)		No, Of fruits per tree	
	1998	1999	1998	1999
* Control	14.68 D	15.04 D	127.003 C	112.00 D
Hand hoeing	19.90 C	22.70 C	146.100 B	159.10 C
Round up 2 %	23.40 B	23.13 C	187.870 A	169.23 BC
Diuron 2%	28.53 A	33.00 A	201.533 A	207.73 A
Gesaprem 2%	26.17 AB	29.90 B	194.870 A	205.87 AB
Mulching by black polyethylene	25.27 AB	31.50 AB	151.300 B	181.63 ABC

Control without weed control .

Means followed by the same letter within each column for each category are not significantly different from each other at 5 % level.

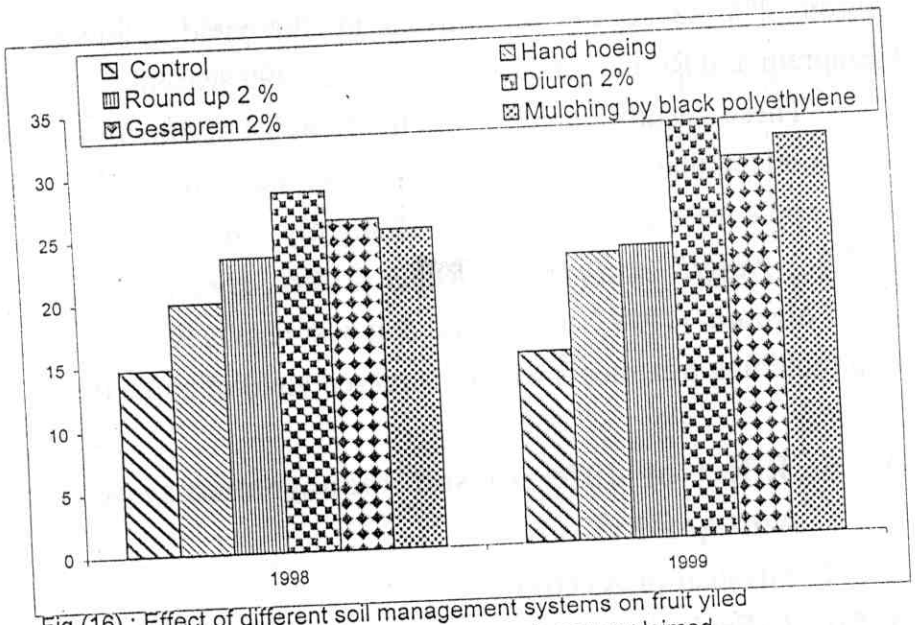

Fig (16) : Effect of different soil management systems on fruit yiled (kg/tree) of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons .

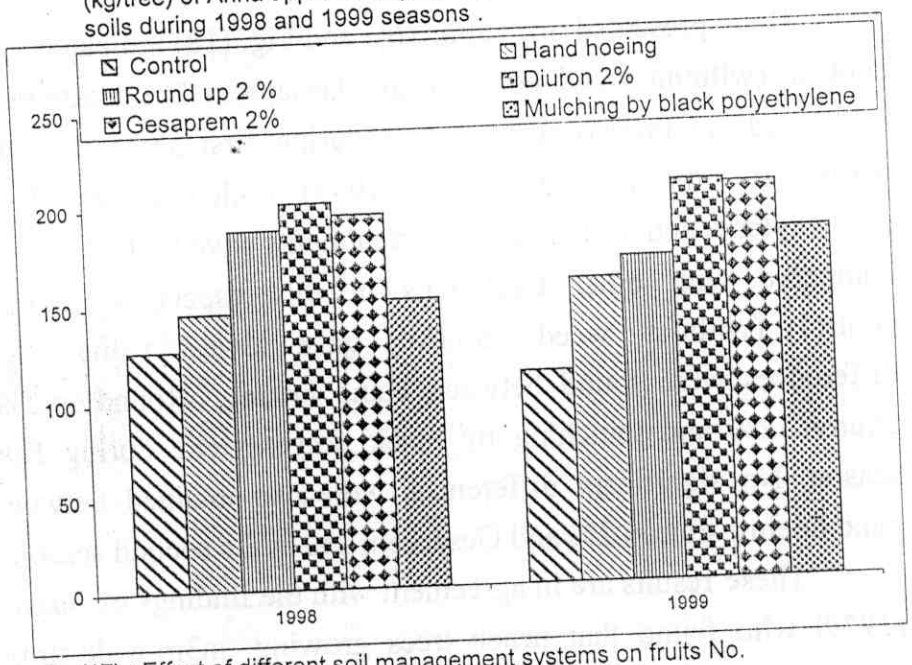

Fig (17) : Effect of different soil management systems on fruits No. per/tree of Anna apple trees grown up in new reclaimed soils during 1998 and 1999 seasons .

Considering herbicide treatments it is quite evident that Diuron 2% succeeded in raising up the yield followed by Gesaprem and Round up during 1998 and 1999 seasons .

These results agreed with the findings of ***Maslov (1979)*** who noticed that removing the grass from the orchard of 8 years – old apple trees depressed the yield slightly . Moreover , ***Baxter (1979) , Niggli et al (1988) , Ruger (1991) , He and Yu (1992) and Fatemah (1999)*** who found that best results were obtained with mulching treatments which increased yield of apple trees .

IV- 5- Effect of different soil management systems on fruit quality: -

IV-5-1 -Physical properties:

IV-5-1 –1 -Fruit size:

Data presented in Table (6) and Fig. (18) indicated that control (without weed control) and Gesaprem 2% treatments succeeded in increasing fruit size during first season (1998) while, in the second season (1999) mulching by black polyethylene and round up 2% treatments gave highest values compared with other treatments in this respect, Moreover, control (without weed control) gave lowest values. No differences were found between Hand hoeing, Round up 2%, Diuron 2% and mulching by black polyethylene during first season, No significant differences were also obtained between hand hoeing, diuron 2% and Gesaprem 2% in the second season.

These results are in agreement with the findings of ***Baxter (1970)*** who found that peach trees growing in3m wide straw mulched strips and apple trees growing under 1.5m wide

mulched strips produced fruits larger in size than the cultivated trees. Also ***Fatemah (1999),*** who reported that mulch treatments increased fruit size visually followed by clean cultivation treatments Paraquat herbicide succeeded in increasing fruit size than those of both Glyphosphate and Afalon's herbicides Moreover, ***Thakur et al., (1993)*** found that mulching with black polyethylene resulted in the heaviest individual fruit size of apple cv. Golden delicious.

IV-5-1-2- Fruit weight:

It is clear from Table (6) and Fig. (19) that Hand hoeing and mulching by black polyethylene treatments caused significant increase in fruit weight during the first season. While, in the second season mulching by black polyethylene and Round up 2% treatments gave highest values than other treatments. No differences were observed between the other treatments during first and second seasons.

These results agreed with the findings of ***Baxter (1970)*** who noticed that peach trees growing in 3m wide straw mulched strips and apple trees growing under 1.5 m wide mulched strips produced fruits larger in weight than the cultivated trees.Also ***Thakur et al., (1993) who*** reported that mulching with black polyethylene resulted in the heaviest individual fruit weight (156.6g) of apple cv. Golden delicious. Besides .In additions ***Fatemah (1999)*** found that fruit weight of mulched trees was heaviest remarkably as compared with both clean cultivation and herbicide systems. Glyphosate herbicide treatment produced fruits heaviest in their weight followed by Afalon's.

IV-5-1-3 -Fruit length:

Data tabulated in Table (6) and Fig. (20) disclosed that no differences were observed between all treatments during first season. However, in the second season fruit length increased by Round up 2% treatment followed by mulching by black polyethylene, Gesaprem 2%, Hand hoeing, without weed control (control) and Diuron 2% respectively. These results are in agreement with the findings of ***Baxter (1970), Hilkenbaumer and Kolbe (1974) and Helail (1981)*** who reported that fruit length was highly increased by mulch.

IV-5-1-4- Fruit diameter:

Data in Table (6) and Fig. (21) showed that Hand hoeing and Round up 2% caused highly significant increase in fruit diameter during the two seasons of study. On the other hand, the other treatments had no effect on fruit diameter during two seasons of study.

These results are in agreement with that reported by ***Baxter (1970), Hilkenobaumer and Kolbe (1974), Zaki (1979) and Helail (1981).***

IV – 5-1-5- Fruit shape index:

Data presented in Table (6) and Fig. (22) showed that fruit shape index was not affected by all treatments during two seasons of study. These findings were confirmed by the results of ***Zaki (1979) and Helail (1981).***

Table (6) : Effect of different soil management systems on physical properties of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons .

Treatment	Fruit size		Fruit weight		Fruit length		Fruit diameter		Fruit shape index	
	1998	1999	1998	1999	1998	1999	1998	1999	1998	1999
Control	170.53A	115.00D	128.90B	111.43C	6.78A	6.43AB	6.35AB	5.8B	1.06A	1.11A
Hand hoeing	145.55B	15017BC	139.67A	124.13BC	6.98A	6.46AB	6.76A	5.89B	1.02A	1.20A
Round up 2%	137.77B	15900AB	126.43B	127.40ABC	6.59A	7.20A	6.45AB	6.69A	1.02A	1.08A
Diuron 2%	147.77B	145.00C	120.57C	124.99BC	6.95A	6.92B	6.31AB	6.1AB	1.10A	1.03A
Gesaprem 2%	161.11A	142.50C	114.55C	141.81A	6.71A	6.89AB	6.22AB	5.93B	1.09A	1.016A
Mulching by black polyethylene	145.11B	168.33A	133.37AB	129.05AB	6.83A	7.03AB	6.05B	6.16AB	1.13A	1.14A

- Control without weed control.
- Means followed by the same letter within each column for each category are not significantly different from each other at 5 % level.

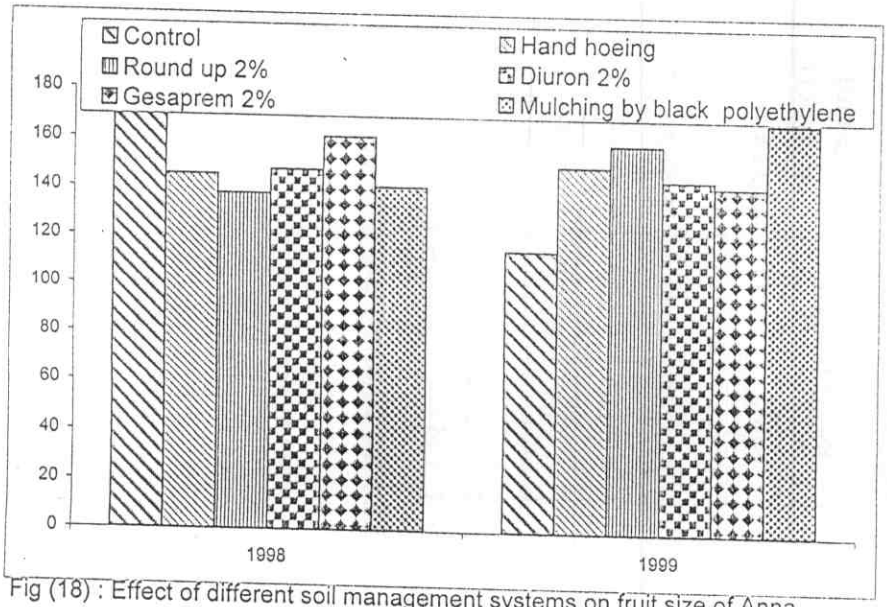

Fig (18) : Effect of different soil management systems on fruit size of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons

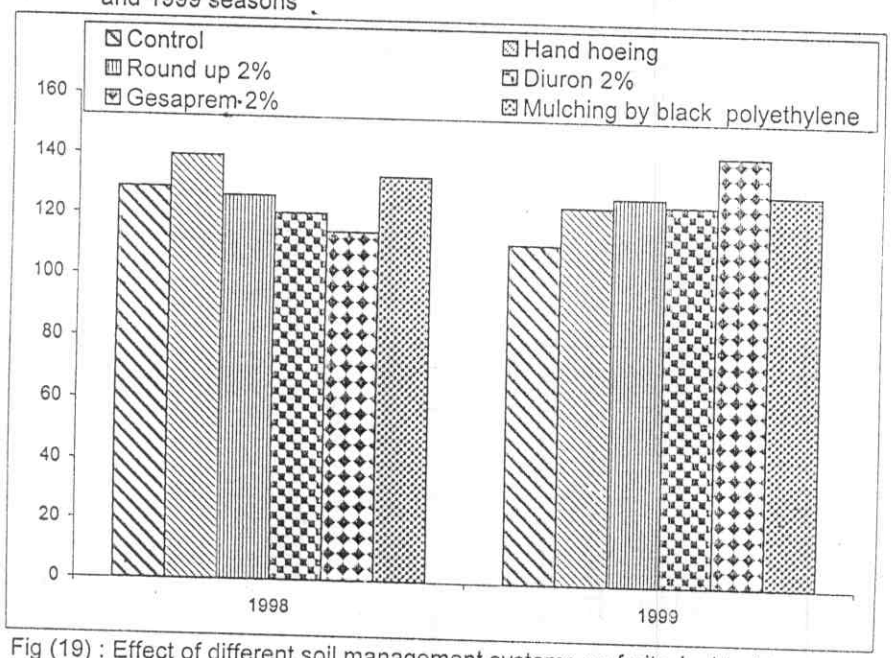

Fig (19) : Effect of different soil management systems on fruit wieght of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons

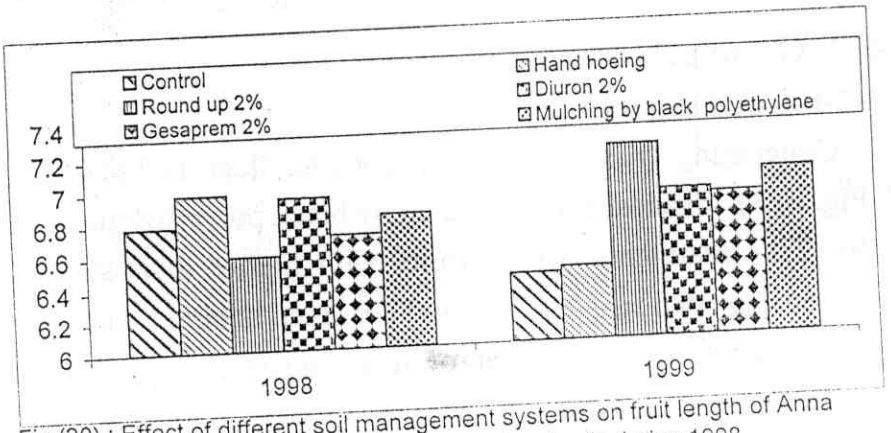

Fig (20) : Effect of different soil management systems on fruit length of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons

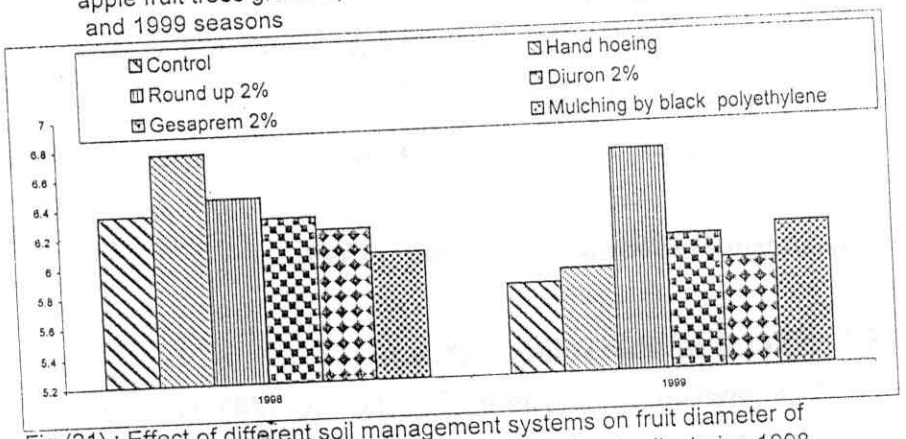

Fig (21) : Effect of different soil management systems on fruit diameter of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons

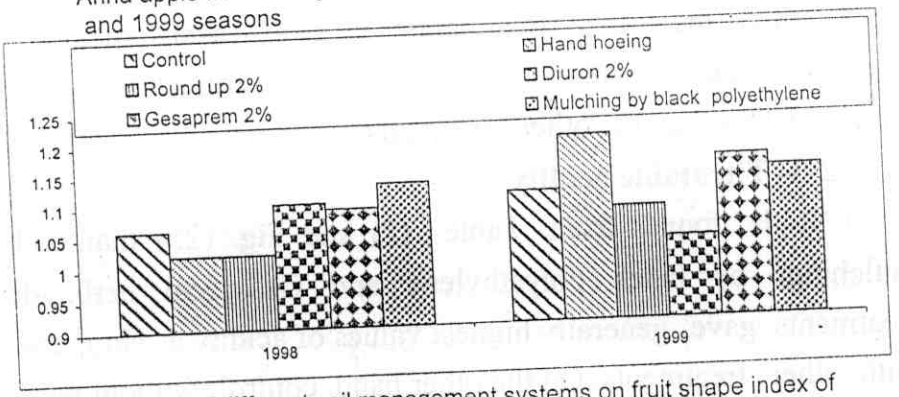

Fig (22) : Effect of different soil management systems on fruit shape index of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons

IV-5-2- Chemical properties:

IV-5-2-1 -Total sugars:

Concerning fruit total sugars content, data in Table (7) and Fig. (23), disclosed that mulch by black polyethylene and Diuron 2% treatments gave fruits with higher total sugars content during two seasons. Meanwhile, Hand hoeing treatment gave fruits with higher amount of total sugars than those of control (with weed control).

On the other hand, herbicide treatments showed that Diuron 2% augmented total sugars comparing with the other two herbicides under this study.

These results agreed with the findings of ***Baxter (1970), Rahovic and Petrovic (1974), Niggili et al (1998), He and Yu (1992), Shergill (1993) and Fatemah (1999).***

IV-5-2-2-Total soluble solids (T.S.S.):

Data presented in Table (7) and Fig. (24) indicated that mulching by black polyethylene gave fruits with higher values of T.S.S .than the other treatments in two seasons of study. However, control (without weed control) gave fruits with lowest values of TSS than the other treatments.

IV-5-2-3- Titratable acidity:

It is found from Table (7) and Fig. (25) that both mulching by black polyethylene and Gesaprem herbicide treatments gave generally highest values of acidity as compared with other treatments. On the other hand, control (without weed control) gave lowest values of acidity than other treatments during two seasons of study.

Table (7): Effect of different soil management systems on chemical proprieties of Anna apple trees growing up new reclaimed soils during 1998 and 1999 seasons.

Entertainment	Total sugar		TSS		Acidity		TSS / acidity	
	1998	1999	1998	1999	1998	1999	1998	1999
Control	4.56D	4.51D	11.49E	11.17 C	0.49E	0.49D	23.45A	22.80A
Mowing	8.54A	8.01B	12.32D	12.78AB	0.65C	0.62C	18.95B	20.16B
Round up 2%	7.69B	7.02C	12.61CD	11.53 C	0.63D	3 0.6C	20.02B	18.30CD
Diuron 2%	8.52A	8.6A	13.28BC	12.61AB	0.65C	0.64C	20.43B	19.80BC
Gesaprem 2%	6.45C	7.46C	13.67B	12.00BC	0.68B	0.70B	20.10B	19.70D
Mulching by black polyethylene	8.63A	8.59A	14.41A	13.52A	0.71A	0.75A	19.21B	18.03D

- Control without weed control.

Means followed by the same letter within each column for each category are not significantly different from each other at 5 % level.

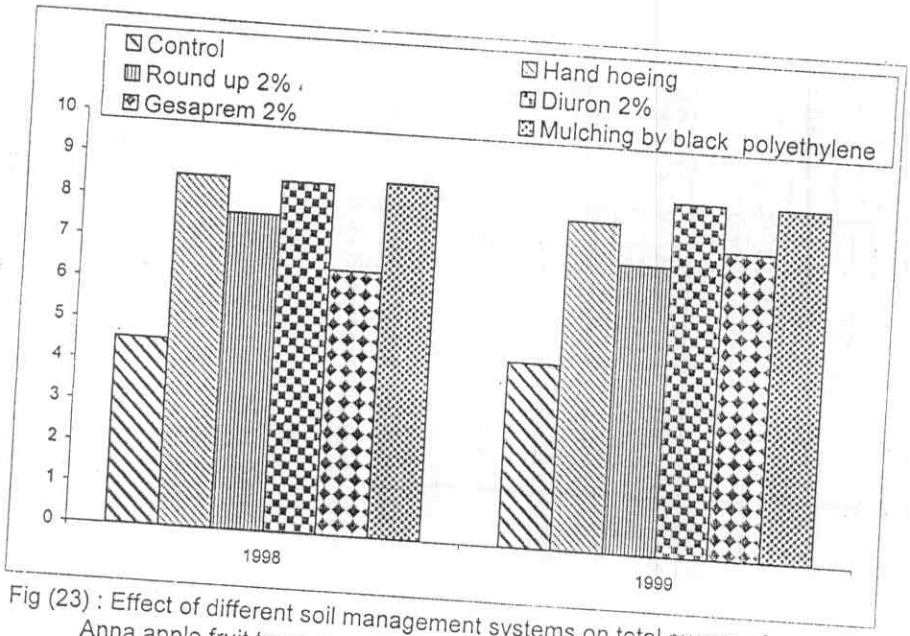

Fig (23) : Effect of different soil management systems on total sugars of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons .

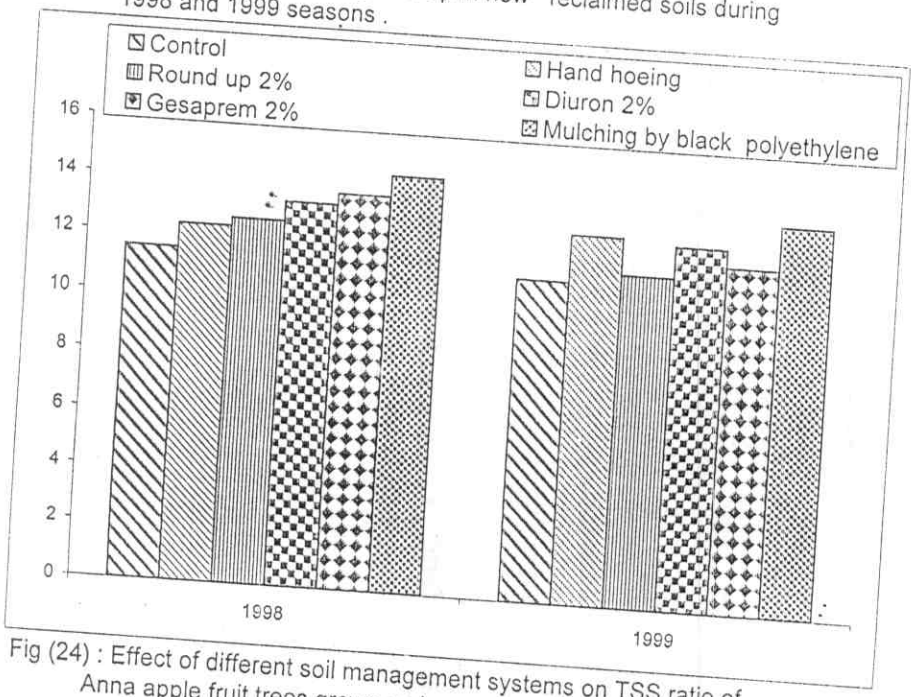

Fig (24) : Effect of different soil management systems on TSS ratio of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons .

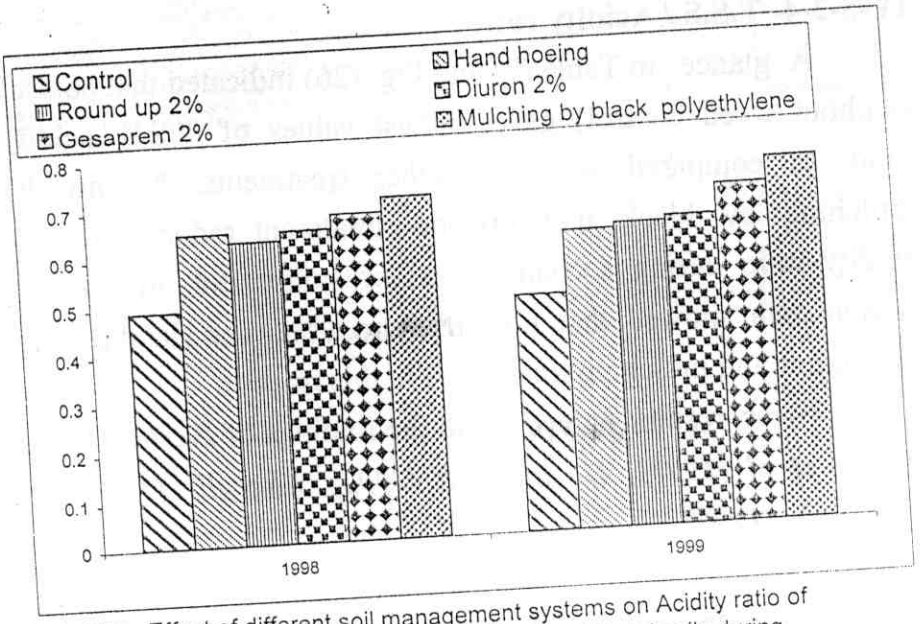

Fig (25) : Effect of different soil management systems on Acidity ratio of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons .

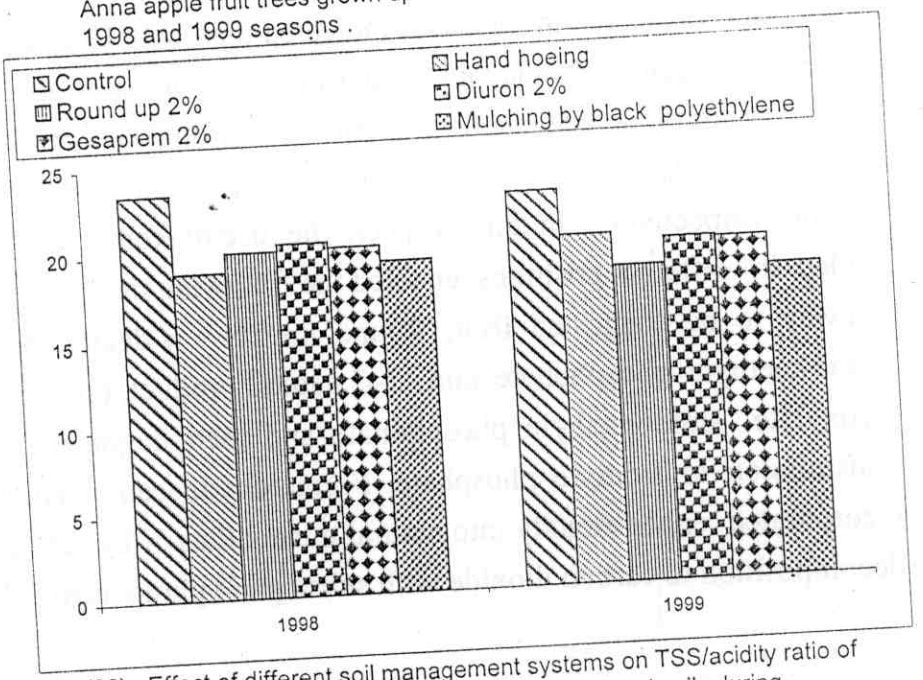

Fig (26) : Effect of different soil management systems on TSS/acidity ratio of Anna apple fruit trees grown up in new reclaimed soils during 1998 and 1999 seasons .

IV-5-2-4- T.S.S / Acidity ratio:

A glance to Table (7) and Fig. (26) indicated that control (without weed control) gave highest values of T.S.S / acidity ratio as compared with the other treatments. Meanwhile, mulching by black polyethylene treatment reduced T.S.S / acidity ratio during second season of study. But, in the first season data showed that no differences between Hand hoeing, herbicides and mulching treatments in this respect.

These results agreed with the findings of ***Baxter (1970), Niggli et al (1998), He and Yu (1992), Shergill (1993) and Fatemah (1999).***

IV-6-Herbicidal fruit residues:

Data presented in Table (8) indicated that, both Round up 2% and Gesaprem 2% had no residues in fruits on Anna apple. On the contrary, a detectable amount of Diuron 2% herbicide existed in fruits (0.013 – 0.022 ppm) during 1998 and 1999 seasons, respectively. In this respect, the use of Round up2%, labeled in different positions, enabled the following degradative pathway to be suggested fruit, Round up 2% is degraded to amino-methyle phosphonate and 2-C natural product, probably glyoxylate aminomethyle phosphonate and then degraded by transmission to fromyle phosphate. Formaldhyde can then be incorporated either directly into natural metabolites or by further decomposition to carbon dioxide with subsequent photochemical

Table (8): Herbicidal fruit residues (p.p.m) of Anna Apple during 1998 and 1999 seasons

Herbicides	1998	1999
Round up 2%	0.000	0.000
Gesaprem 2%	0.000	0.000
Diuorn 2%	0.013	0.022

re-fixation. use of glycine $-2\text{-}C^{14}$ labeled Round up confirmed the expected greater incorporation of the label into natural products compared to the glycine $1\text{-}C^{14}$ label. The reason that the c –1 position of glyoxylate has the potential to be eliminated as carbon dixoxide in the glyoxylate and citric acid cycles, whereas the c-2 position is usually incorporated into several intermitted natural products and there for is retained in the metabolite pool , Although loss of C^{14} from the plants was predicated this way , no data were presented confirming or quantileyeing this . On the other hand, Gesapreem can easily metabolize in plants . Similar results was reported by ***Putnam (1976)*** who discovered two C 14 labeled compound in apple and pear trees 90 days after treatment with C^{14} Round up 2% .

The majority of the C^{14} activity was associated with Round up (92 – 97%) but small amounts of aminomethye phosphoric acid (1 –7%) were datected .

In addition, ***Harrington et al (1992)*** found that Round up and Amitrole were the most commonly used knock down herbicides, while traizines (particularly simazine and terbuthylazine and telumelon) were the most popular redial

herbicides . These result agreed with the finding of ***Jordan and Russell (1979)*** stated that 8 – 16 Ib / acre , Round up recorded negligible harvests reisdues in citrus fruits .

Also, ***Fatemah (1999)*** reported that, both Glyphosate (Round up) and Parquet herbicides had no residues in Anna apple fruits ,

On the other hand, residues of Afalons herbicide was obtained in fruits of treated trees.

IV-7-Cost of different soil management systems of Anna apple trees :

Data presented in Table (9) and Fig. (27) indicated that Hand hoeing gave high cost compared with Gesaprem herbicide (700 Egyptian pound and 300 Egyptian pound) during two seasons, on the other hand , Round up herbicide gave high costs compared with other herbicides. Meanwhile, mulching by black ployethylene gave intermediate costs compared with Hand hoeing and herbicides, but on the long term mulching by black polyethylene gave lowest cost than other treatments (Hand hoeing or herbicides) .

This reality one in general agreement with the finding of ***Wessels (1968)***,who stated that herbicides (Bromacil and Diuron were estimated to be cheaper than the manual cultivation (hand hoeing) required in abnormal season. Besides, ***Egger (1989)***, stated that the cheapest method for controlling weed flora was using Simazine and Glyohosate herbicides On the contrary, ***Fatemah (1999)***, reported that mulch system was more prohitalile for Anna apple grows followed by herbicide treatments in compared with clean cultivation treatments.

Glyphosate herbicides used in this study was in the highest net return. While paraquat herbicide took the other way around this respect. .

Table (9): The costs of different soil management systems Of Anna apple trees grown up in new reclaimed soil during 1998 and 1999 seasons.(Egyptian pound per feddan).

Treatments	Total costs (L.E.) / Fed.	Price of yield increase (L.E.) / Fed.	Net return (L.E.) / Fed.
Control	0.00	0.00	0.00
Hand hoeing	350.00	2254.0	1904.0
Round up	280.00	2943.5	2663.5
Diuorn	190.00	5568.5	5378.5
Gesaprem	150.00	4613.0	4463.0
Mulching by black polyethylene	230.00	4735.5	4505.5