The efficacy of some plant nutrients and alternative chemicals against the cotton spiny bollworm *Earias insulana* (Lepidoptera : Noctuidae), at Alexandria Governorate.

Mesbah, H.A,[1] E.H. Tayeb[1], M.M.El-Bassiony [2] and A.Z.El-Naggar[2]
(1)Deportment of plant protection, faculty of Agriculture (Saba Basha) , Alex. Univ.
(2)Plant Protection Res., Institute Agric. Res. Center, Alex. , Egypt.

ABSTRACT

The present study was carried out to evaluate the efficiency of an insecticide Baythroid®, nine nutritive foliars and alternative chemical compounds, tested either alone or in consequence upon the biofertilized cotton plants of Gize-70 during three successive seasons from 1999 up to 2001in the Integrated Pest Management program (IPM) of the spiny bollworm (*Earias insulana*). Besides, their side effects on cotton yield losses, crude fat and moisture content of gained cotton seeds.

The results of season 1999 decleared that the applid bi and /or tri- sequent sprays of Baythroid® with Greenzit N.P.K or with Greenzit $S.P_{100}$ and Ascorbic acid efficiently decreased the spiny bollworm infestation up to 0.29 and 0.33 larvae/10 bolls. The treatment of Sirene was less efficient in controlling the insect pest-1.95 larvae/10 bolls.

In the following seasons 2000-2001 the tri-consequent sprayings of Baythroid® with Greenzit $S.P_{100}$ and Ascorobic acid or/ and Greenzit N.P.K and Neem oil were utmostly efficient and gave high reduction of infestation level. Versus, the performance of tri- sequent sprayings of Thyroxine with polymex and potasin-f(season 2000) or / and with polymex and Ascorbic acid (season 2001) which gave a relatively higher Level of spiny bollworm infestation. Moreover, the treatment of growing cotton plants from the soaked seeds for 12 hours Thyroxine solution (1 ml /1L) and later sprayed by sequented Thyroxine solution with other tested foliar nutrients was least efficient in reducing spiny bollworm infestation and gave higher yield losses.

For the bio-fertilized plants, the tri-sequent sprayings of Baythroid® with Greenzit N.P.K and Neem oil gave the highest value of gained yield and lowest level of spiny bollworm infestation in both seasons. While, the application of Thyroxine with Greenzit N.P.k and / or Thyroxine with Greenzit $S.P_{100}$ and Ascorbic acid gave higher levels of insect infestation and lowest values of cotton yield(season 2000 and 2001 , in respect). Noticeably, the grown plants from treated seeds with Thyroxine in season of 2000 and bi-sequently sprayed by Baythroid® with Greenzit N.P.K gave a higher value of gained yield coincided with a lower level of spiny lollworm infestation, versus, the treatments of potasin- f or Greenzit N.P.K alone and / or potasin – f followed by Greenzit N.P.K and Ascorbic acid that gave lower values of cotton yield and higher calculated percentages of spiny bollworm infestation.

Highly effective treatments in decreasing yield losses were the applications of tri-sequent sprays of Baythroid ® with potasin-f and Greenzit N.P.K or / and with polymex and Asorbic acid on the bio-fertilized cotton plants with Microbin® (Season 2000). Also the application of Baythroid ® with Greenzit N.P.K Neem oil (Season2001); vice versa

application of bi- and tri-Sequent sprays of Thyroxine with Greenzit N.P.K or / and Thyroxine with Greenzit N.P.K and Neem oil were rather least efficient in decreasing yield losses (seasons 2000 and 2001, in respect) .

For the fio- fertilized plants, the tri-sequent sprayings of Baythroid® with Greenzit N.P.K and Ascorbic acid; and Thyroxine with Greenzit N.P.K and Neem oil gave the highest estimated value of crude fat in the both seasons. While, the other performed foliar treatments indicated lower values of crude fat than or equal to that of the untreated check. The measured moisture content of seeds to more or less extent was higher or lower than that of the untreated check. All the applied foliar treatment on the grown plants from seeds treated with thyroxine, indicated more or less lower values of crude fat, but, the application of Baythroid® with Greenzit N.P.K, samewhat increased the moisture content of the seeds, campared to the other performed treatments.

INTRODUCTION

The cotton bollworms are regarded as one of the most destructive insect-pests of cotton plants in Egypt. Cotton is considered the preferred host for these insects. The indiscriminate use of insecticides has caused a number of ecological, economical and social problems to various ecological niches around the world including Egypt. Besides, the resistance of several classes of insects to pesticides.

Fertilization or / and foliar nutrients sprays might be good tool to produce a profitable cotton crop that competes with weeds and able to out grow and overcome the disease and insect damage . Foliar spray can also correct the resulting deficiencies due to the lack of certain nutrients which are required in large amaunts (macro-elements) and / or required in trace amounts (micro – elements). Locke and Eck (1965) and Michaeal Treshow (1970) and El-Naggar (1998).

The present study was directed to evaluate certain treatments of many macro& micro faliar nutrients and alternative chemical compounds tested either alone or in bi, tri and tetra consequent applications as a pest control measures spiny bollworm. In addition to evaluating its effect on cotton yield, yield lasses, crude fat and moisture content of gained cotton seeds.

MATERIALS AND METHODS

Field experiments were carried out at the experimental farm, faculty of Agriculture, (Saba Basha) , Alexandria University , Egypt, during three successive growing cotton seasons of 1999,2000 and 2001. whereas , in the three seasons, an area of half Fadden was cultivated with cotton variety "Giza70" on April the 8^{th} , 23^{rd} and 18^{th}, respectively. The used experimental design was the split design with three replicates as well as untreated check.

In the cotton season of 1999, prior to planting the cotton seeds were treated with the bio-fertiiizer "Microbin®" then sown at 25 cm apart between hills with plant spacing of 60 cm between furrows. The experimental area implied 12 treatments in addition to an untreated check. The treatments included certain foliar fertilizers, alternative chemical compounds, besides a Pyrethrod insecticide(Baythroid®). The tested compounds were used at the rates shown in Table(1).

In the conducted experiments during the cotton season of 2000 experimental area was divided in two subsets. In the 1st subset, cotton seeds were treated with bio-fertilizer," Microbin®", and included 15 treatments in while in the 2nd one , the seeds were treated with Thyroxine and implied 6 treatments in addition to untreated check. In the performed experiment in season 2001, the cotton seeds were treated with bio Fertilizer, "Microbin ® " , and included 13 treatments in addition to check. The tested experimental dosages of each of these evaluated compounds are shown in Table (1). The treatmental applications of each tested compound were applied at following different periods, at the beginning of flowering period, at period of fifty percentage of flowering and the beginning of fruiting; except, the case of Thyroxine treatment, where the sprays of growing cotton plants began after 45 days from sowing date and furtherly continued as described for the three aforementioned periods.

For the whole seasons of the study, inspections were carried out for determining the efficiency of the tested compounds on the populations of the spiny bollworm (*Earias insulana*), properties of plants, yield and yield parameters. Sprayings were performed using knapsach sprayer (20L).

SAMPLING TECHNIQUE

1- Cotton estimation of the spiny bollworm infestation:

The inspected bollworm was the spiny bollworm (*Earias insulana*) (Lepidoptera : Gelechiidae).

Prior to the application of foliar treatments, an initial estimation of the level of infestation was carried out immediately to determine the primary infestation level of the spiny bollworm. Later weekly samples of 10 green bolls/ plot were taken randomly; the examined bolls for each treatment were 30 green bolls. The level of infestation by bollworms was weekly estimated along seven weeks during the following seasons of 1999,2000 and 2001. Statistical analysis using "F" and "L.S.D" tests was performed for the comparison and evaluation of the tested foliar fertilizers, alternative chemical compounds and Baythroid® on the detected infestation of the spiny bollworm.

2- Determination of cotton yield:

In each treatment ripened open bolls from twenty- five cotton plants were collected to determine the rate of cotton yields/plant, from which, the total yield / feddan was relatively calculated.

3- Estimation of loss in cotton yield caused by the bollworm (*Earias insulana*):

According to the followed procedure in the works of Awad (1982), El-Naggar (1998) and, throughout the consequent cotton seasons of 1999/2000 and 2001, thirty cotton plants were randomizely chosen in each treatment for detecting and counting the numbers of completely open bolls,2/3 and 1/3 open bolls and symboled by the letters A,B and C, respectively. Also, green and dry bolls were transferred to laboratory for examining and counting the infested dry bolls (D) and green bolls (E) . Then , the expected open bolls (F) were calculated as follows:

$$F= A+B+C+D+E$$

Also , the true opened bolls (G) were calculated as followes:

$$G= A+(B \times {}^{2}/_{3}) + C \times {}^{1}/_{3})$$

Then , the number of the unopened bolls (H) was calculated as follows:

$$H = F- G$$

The percentage of loss (I) was estimated according to the following equation: % of loss((I) = H/ F x 100.

4- Determination of cotton seed constituents (chemical methods):

a. Moisture:

The determination of moisture content was carried out according to A.O.C.S. Official method (1973) in an air oven at 101 °C ± 1 °C.

b. Crude fat :

Crud fat is determined by Soxhlet extraction apparatus using petroleum ether (b.p. 60-80 °C) as described by A.O.C.S. official Method (1973), the solvent was evaporated and the extracted fat was weighted.

5- The main compounds and chemical formula of the used foliar materials:

5-1- Foliar fertilizers and micro-elements formulations:

a- Greenzit S.P 100:

The main components are:

EDTA	Na2 MN	40%
EDTA	Na2 Z	43%
Fe, Mg, Mn, B, Zn, Cu, Mo, Ni , Co		12%

Concentrations of Ferric and micro-elements by mg/kg:

Co	0.054	Fe	5.40	Mo	0.027	Mg	0.54
Ni	0.005	Mn	5.54	Cu	0.005	Zn	70.27

b- Greenzit N.P.K. 5144:

The main compounds:

Micro-elements mg/L		Macro-elements gm/L	
Fe	1000	N	70
Mg	100	P	30
Mn	100	K	39
B	100		
Zn	50		
Cu	10		
Mo	5		
Ni	1		
Co	1		

c- Potasin F:

The main components are : N.P.K.(0:10:30), 30% potassium oxide 10% fivith potassium oxide.

d- Polymex:

Zn, Fe, Mn , cu , B, Mg, (supplied by Mesbah in 2001).

e- Ascorbic acid :

($C_6H_8O_6$) while to slightly yellow crystals .

f- Nitrate balancer :

The main components are : B 11.79% , Mo 0.00655%

5-2- Agerin:

It is biological insecticide from *Bacillus thuringiensis* (B.T.)32000 u/mg.

5-3-Thyroxine:

Chemical name : Tetraiode thyronine-T_4.

5-4-Cyfluthrin: (Baythroid) ® :

It is synthetic Pyrethroid used for insect control. In this was used as Baythroid® E.C. 50% formulation.

Chemical name : (RS) -œ - Cyano- 4- fluro-3 œ Phenoxbenzyl (1Rs, 3Rs= 1Rs,3SR)-3- (2.2-dichlorovinyl) -2.2-dimethlcycloprop – anecarboxylato.

5-5-Neem Oil :

Formulation : Azadriachtin Emulsifiabl Concentrate,1500 ppm.

RESULT AND DISCUSSION

1- Efficiency of Sirene and evaluated foliars application on the spiny bollworm infestation:

a. Season of 1999:

The obtained results of the carried out treatments for determining their effect on spiny bollworm infestation are illustrated in Table (2), and expressed as mean numbers of the spiny bollworm larvae per ten bolls.

It could be noticed in table (2) that each of the performed bi-and/or tri-sequent sprays of each of the performed bi-and/or tri-sequent sprays of Baythroid® /Greenzit N.P.K; Baythroid® / Greenzit $S.P_{100}$ / Ascorbic acid gave high efficient control of the spiny bollworm (0.29 and 0.33 larvae/10 bolls, in respect). For the other tested foliar sprays that estimated level of spiny bollworm infestation to a less extent, increased up to 1.95 larvae/10 bolls in case of Sirene alone or /and untreated check. In the other applied foliar treatments, that rate of the spiny bollworm infestation more or less lowered and calibrated from 0.52 to 1.61 larvae/10 bolls.

b- Season 2000:

The exhibited data in Table (3) show the response of bio-fertilized cotton plants to the effect of each of performed foliar treatment on the calculated means of inspected spiny bollworm larvae/10 bolls. The data in table (3) revealed that each of the performed tri-sequent sprayings of Baythroid® / Greenzit $S.P_{100}$ / Ascorbic acid and Baythroid® / Greenzit N.P.K./ Neem oil gave a highly efficient control of spiny bollworm (0.33 larva/10 bolls). That lower level of spiny bollworm infestation to a more extent was increased up to 1.19 larvae/10 bolls in case of the tri-sequent sprays of Thyroxine/ polymex / potasin-F . For the other applied foliar treatments that rate of spiny bollworm infestation to a more or less extent, increased and resembled a range of 0.47-1.04 larvae/10 bolls in comparison to the untreated check (0.57 larvae /10bolls).

Another trend of results was explained when the planted cotton seed were soaked for 12 hrs in prepared Thyroxine solution at a rate of 1 ml/L. The included results in Table(4) show the effect of spraying Thyroxine alone or / and the other tested bi-or/and sequent foliar applications on the growing plants from the soaked seeds in Thyroxine. In general the inspected levels of spiny bollworm infestation were more or less higher than that found for the cotton plants of untreated check(0.57 larvae/10 bolls) and ranged from 0.71 larva/10 bolls in case of the bi-sequent spraying of Baythroid® / Greenzit N.P.K. to 1.42 larvae/10 bolls for Thyroxine alone or/and the tri-sequented sprays of Potasin-F/Greenzit N.P.K./Ascorbic acid.

c- Season of 2001:

The included results in Table (5) exhibit the revealed effects of different tested foliar sprayings on the calculated mean numbers of the inspected spiny bollworm larvae per ten bolls. The tri-sequent spraying of Baythroid® / Greenzit N.P.K/ Neem oil gave a high efficient control of spiny bollworm larvae, whereas, the comparative reduced mean numbers of inspected larvae amounted to 0.23 larvae/10bolls (table 5). That lower level of insect infestation was followed by the tested bi-or/and tri-sequent foliar sprays of Baythroid® /Greenzit N.P.K., Baythroid ® / Polymex / Ascorbic acid and Baythroid® / Potasin - F/Greenzit N.P.K. which gave a mean numbers of the spiny bollworm infestation comprised 0.38 larva/10 bolls. For the other tested foliar sprays the estimated levels of the spiny bollworm infestation to a less extent, increased up to a maximal mean number of 0.76 larvae/10 bolls in case of the tri-sequent sprayings of Thyroxine/ Polymex / Ascorbic acid and Thyroxine / Greenzit $S.P_{100}$ / Ascorbic acid; and calibrated in the rest foliar treatments from0.42 in case of the bi-sequent sprayings of Baythroid® / Greenzit $S.P_{100}$ up to 0.67 larva/10 bolls in case of tetra-sequent sprayings of Agerin/ Thyroxine / Polymex / Ascorbic acid in comparison to the untreated check (0.80 larva /10 bolls).
Moreover, the results in the present work were in agrement with the work of Mahasen Abdel- Aziz (2002); in which the foliar application of the following foliars: Potassium foliar fertilizer (38% Potassium) and Potasin- F (30% Potassium oxide and 10% Phosphor dioxide) at a rate of one liter/fed., in addition to a sequent spraying with Ascorbic acid (30 g/fed.) and / or Salicylic acid (30 g / fed.) in greenhouse and field trials had a significant effect on reducing the percentages of the spiny bollworm infestation and increasing the actual yield in comparison to untreated plots.

The results also indicated that the application of Neem oil alone was less effective on the incidence of the pink bollworm and spiny bollworm infestations, and were in agreement with those stated by Nimbalkar *et al.* (1993) who explained that the tested extracts of Neem and *Pongamia glabra (P. pinnata)*, 1% indiara (of unstated composition), 0.5 Neem oil and 0.06% Endosulfan failed in iniating better control than Endosulfan.

Mahasen M. Ibrahim *et al*,(2000) confirmed that the highest efficiency in reducing the percentage of infestation with both the pink and the spiny bollworms was recorded for the treatmental application of Baythroid® [Cyfluthrin] , which gave a reduction rate comprising 91.55%, followed by Fenvalerate – 88.43% , ES, Fenvalerate 85.33% and Fenpropathrin- 83.64%.

Moreover, the results showed that the application of Greenzit N.P.K. alone was ineffective on the incidence of the spiny bollworm, and were in

agreement with the mentioned results in the works of El-Naggar (1998) and Mesbah *et al* (2000), versus, those obtained results by Purohit and Deshonde (1994) who stated that the infestation level of the spiny bollworm was affected by the application of Greenzit N.P.K. alone.

2- Effect of tested foliar nutrients & alteranative chemicals on the cotton yield and the spiny bollworm infestation:

The field experiments throughout the growing cotton seasons of 2000 & 2001 indicated that the application of tri-sequent sprays of Baythroid® with Greenzit N.P.N. and neem oil or with Greenzits $S.P_{100}$ and Ascorbic acid on the bio – fertilized cotton plants with Microbin® gave the highest calculated values of cotton yield (13.7 & 14.2 kent /fed.) and lowest percentages of the spiny bollworm infestation (2.9 & 2.9%). The consequent spraying of Thyroxine with Greenzit N.P.K and Potasin- F followed by Greenzit N.P.K. and Ascorbic acid gave the lowest values of gained yield (2.5 & 2.7 Kent. / fed.) in front of the highest or/and higher percentages of the spiny bollworm infestation (8.8%) compared to the untreated check (3.04 kent/ fed. & 5.08) (Table 6).

Comparatively, for the growing plants from treated seeds with Thyroxine, the application of tested foliar chemicals gave relatively lower yield values &higher infestation levels of bollworm than that of the bio-fertilized ones. Whereas, the bi-sequent spraying of Baythroid® with Greenzit N.P.K. indicated a higher value of gained yield coincided with a lower percentage of the spiny bollworms infestation (5.7 kent./fed. And 9.7%). The performance of each treatment of Potasin or Greenzit N.P.K. alone and / or Potasin-F/ Greenzit N.P.K./Ascorbic acid revealed rather lower values of cotton yield (2.1 , 1.5& 1.1 kent,/fed.) and higher calculated percentages of the spiny bollworm infestation (14.2 , 14.9 & 19.4% respectively) compared to the untreated check (3.04 kent./fed.& 7.7%) (Table 7).

The results of season 2000 were identically to that in which the performance tri-consequent sprays of Baythroid® with Greenzit N.P.K. and Neem oil performed in season 2001 gave the highest value of gained yield and a lower percentage of spiny bollworm infestation (7.1 kent./fed. and 3.1 %) . Compared to the untreated check (1.9 kent./fed.& 10.6 %), the consequent sprayings of Thyroxine with Greenzit $S.P_{100}$ followed by Ascorbic acid ,and or Polymex prior to Ascorbic acid gave rather lower values of gained yield amounted to 1.6&1.8 kent./fed in from of higher percentages of the spiny bollworm infestation which comprised 10.06 & 9.4%, in respect (Table8).

Our above mentioned results in the present work declare that the performed application of bi-and/ or tri-sequent sprays of Baythroid® with Greenzit S.P100, Greenzit N.P.K.; and Polymex / Ascorbic acid on bio-fertilized cotton plants gave the highest values of cotton yield. The results Also, revealed that the application of Baythroid ® with Greenzit N.P.K. and Neem oil gave a high increase in cotton yield. This results are in agreement with those conducted by El-Naggar (1998) and Mesbah *et al.* (2000) who concluded that the application of bi- and / or tri-sequent sprays of the pyrthroid- Polytrin® with Greenzit S.P.100, Greenzit N.P.K, and Polymex/ Ascorbic acid increased the cotton yield.

Mahasen A. Aziz(2002) found that the testing some foliar nutrients on cotton plants in the greenhouse and field trials as foliar application of the following nutrients prepartions: Potassium foliar fertilizer (38% Potassium) and Potasin- F (30% Potasium oxide and 10% phosphor dioxide) at a rate of one liter/ fed., well as the spraying with Ascorbic acid (30 g/fed. and / or Salicylic acid (30 gm /Fed.) had a significant effect in reducing economic losses and increasing the actual yield in comparison to the untreated plants.

3- Efficiency of foliar applications on the yield losses of 2000 and 2001cotton Seasons:

The included results in Table (6), show the effect of applied foliar treatments on yield losses of growing season of 2000; which had been calculated as percentage of the remaining green and / or dry bolls after gaining the yield of full opened bolls of each treatments. It is obviously noticed that the treatments of tri-sequent sprays of Baythroid® / Potasin- F/ Greenzit N.P.K. & Baythroid® / Polymex/ Ascorbic acid gave the lowest values of yield losses comprising 9.04 & 10%, respectively; followed by Baythroid® with Polymex / Potasin-F and / or Greenzit N.P.K./Neem oil- 12.05 and 13.9% in respect. The highest estimated values of yield losses amounting to 63.5 & 74.3% were recorded for the foliar treatments of Thyroxine with Polymex / Potasin-F or / and Greenzit N.P.K,., respectively, compared to the untreated check- 57.6%. In the other performed treatments the measured values of yield losses were less than that of the untreated check (57.6%) and ranged between 16.2 and 51.4%.

The exhibited results in Table (7) declare as well the calculated yield losses of grown cotton plants from treated seeds with Thyroxine. Herein, the foliar application of Thyroxine alone, as well as Greenzit N.P.K. and / or Potasin- F gave the highest deduced values of yield losses 70, 74.4 & 87.3 %, respectively, compared to the untreated check 57.6%. While the involvement of Baythroid® with Greenzit N.P.K. or / and Polymex /

Potasin-F, comparatively decreased the percentage of yield loss up to 15.7 & 16.9 %, respectively.

Identically, the demonstrated results in Table (8) elucidate the efficiency of foliars application on the yield losses in the season of 2001.

The estimated values of yield losses in the season of 2001 were in general higher than those of season 2000. The treatment of tri-sequent sprays of Baythroid® / Greenzit N.P.K./Neem oil gave the lowest value of yield losses comprised 26.3% followed by Baythroid® with Greenzit N.P.K and /or Polymex / Potasin- F 32.07 &32.4% . Versus the foliar treatment of tri-consequent sprays of Thyroxine/ Greenzit $S.P_{100}$ / Ascorbic acid which gave the highest value of yield losses71.9% compared with the untreated check 61.5%. The results of the present work decleared the ligher efficiency of the applied bi-and or tri sequent sprays of Baythroid® with Breenzit $S.P_{100}$ or/ and Polymex/Ascorbic acid which gave lower yield losses. That was ascertained by the findings of many workers, *i.e*, the stated results by El-Naggar (1998) and Mesbah *et al.* (2000) in which the application of bi-and/ or tri- sequent sprays of Polytrin® with Greenzit $S.P_{100}$ or / and Polymex / Ascorbic acid gave the lowest values of yield losses.

In the meanttime Mahasen Abdel-Aziz (2002),found that the spraying of Potassium foliar fertilizer (38%Potassium) and Potasin- F (30% Potassium oxide and 10% Phosphor dioxide) at a rate of one liter/fed., in addition to a sequent spraying with ascorbic acid (30g/ fed.) and / or Salicylic acid (30 g/fed.)in greenhouse and filed trials had a significant effect in reducing the economic loss of cotton yield, compared to the untreated check.

4- Effect of applied foliars on crude fat and moisture content of gained seeds from the treated cotton plants in seasons-2000& 2001:

For the bio-fertilized cotton plants in season 2000, the estimated values of crude fat & moisture content were highest in case of the consequent spraying of Baythroid® with Greenzit N.P.K. and Ascorbic acid or/and Potasin-F with Nitrate balancer (21.7% &11.8%, in respect). The other performed foliar treatments indicated values of crude fat lower than or equal to that of the untreated check (20.5%) and calibrated from 15.6 to 20.5%. The measured moisture content of seeds was higher than that of the untreated check (10.4%) and ranged from 8.2% to 10.9% (Table 9).

The grown plants from treated seeds with Thyroxine, applied foliar treatments indicated lower values of crude fat than the untreated check (20.5%) and ranged between 17% & 20.2%. Compared to the untreated check (10.4%), the bi-consequently sprayed Baythroid® with Greenzit N.P.K., somewhat increased the moisture content of the seeds up

to 11.3%, while, in the other performed foliar treatments, that value was equal or lower than the untreated check and ranged from9.2 to 10.4% (Table10).

Meanwhile in cotton season of 2001 the highest estimated value of crude fat (21.6%) was recorded for the treatment of tri-sequent spraying of Thyroxine with Greenzit N.P.K. and Neem oil. The applications of bi-and/ or tri-sequent sprays of Baythroid® with each of tested formulation of Greenzit N.P.K. or $S.P._{100}$ and / or with Greenzit $S.P_{100}$ and Ascorbic acid remarkedly reduced the estimated value of crude fat up to 15.8, 16.9 & 17.1 , respectively than that of the untreated check(19%).

The application of bi-and/ or tri-sequent spraying of Baythroid® with Greenzit N.P.K. or with Polymex and Ascorbic acid as well as Thyroxine with Greenzit $S.P._{100}$ and Ascorbic acid increased the moisture content up to 11.2% ,versus, the other applied foliar treatments which revealed either equal or lower values than that of the untreated check (9.8%) comprising rang of 9.1-9.9% (Table 11).

From the above cited results it could be seen the positive effect of the sprayed synthetic pyrethroid- Baythraid® with Greenzit N.P.K & Ascorbic acid in increasing the calculated percentage of crude fat (21.7%) These results are in accordace to many investigators Abdalla (1980&1986), Sawan *et al* (2001) and khurana *et al* (1994).

In general, the measured value of crude fat extracted from untreated seeds of cotton cultivar G.70 (19-20.5%) was similar to that attained by Abdalla (1980 & 1986) . Sawan *et al* (2001).

The higher N-rate, as well as the application of all growth retardant and Zn resulted in an increase in cotton seed yield, seed protein content, oil and protein yields/ha, seed oil refractive index, unsaponifiable matter and total unsaturated fatty acids (oleic and linoleic).Besides, the treatments also tended to decrease oil acid value, saponification value, and total saturated fatty acids.Khurana *et al.* (1994) stated that the estimated higher percentage of oil value was recorded for Cypermethrin and Quinalphos treatments.

Table (1) : The tested foliars and Sirene alone or in sequence and their rates of application during the growing cotton seasons of 1999 -2000 and 2001.

Treatments	Rate of application / l
Season 1999	
Seed treated with bio-fertilizer "Microbin® "	
Baythroid / Polymex / Ascorbic acid	2.5 ml/0.5 g/1g
Baythroid / Greenzit S.P_{100}	2.5ml/0.5g
Baythroid / Greenzit N.P.K	2.5 ml /1.5 ml
Baythroid / Greenzit S.P_{100}/ Ascorbic acid	2.5 ml /0.2g /1 g
Baythroid / Potasin-F / Greenzit N.P.K	2.5 ml /5 ml/1.5 ml
Potasin-F /Nitrate Balamcer	5 ml/20 ml
Potasin- F / Greenzit N.P.K/Ascorbic acid	5 ml/1.5ml/1 g
Neem oil	1ml
Agerin / Sirene®	1.25 g/2000 d/f
Neem / Agerin	1 ml /1.25 g
Agerin	1.25 g
Sirene®	2000 d/F
Season 2000	
A.Seed treated with bio-fertilizer "Microbin® "	
Baythroid / Polymex / Ascorbic acid	2.5 ml/0.5 g/1g
Baythroid / Greenzit S.P_{100}	2.5ml/0.5g
Baythroid / Greenzit S.P_{100}/ Ascorbic acid	2.5 ml /0.2g /1 g
Baythroid / Greenzit N.P.K	2.5 ml /1.5 ml
Baythroid / Potasin-F / Greenzit N.P.K	2.5 ml /5 ml/1.5 ml
Baythroid / Greenzit N.P.K/Ascorbic acid	2.5 ml/1.5ml/1 g
Baythroid / Greenzit N.P.K/Neem oil	2.5 ml/1.5ml/1 ml
Baythroid / Greenzit S.P_{100} / Potasin-F	2.5 ml /0.5 g /5 mi
Baythroid / Polymex / Potasin-F	2.5 ml/0.5 g/5ml
Potasin-F/Nitrate balancer	5 ml/20 ml
Potasin-F/Greenzit N.P.K/Ascorbic acid	5 ml/1.5 ml /1 g
Thyroxine	1 ml
Thyroxine / Polymex / Potasin- F	1 ml /0.5 g/5ml
Thyroxine / Greenzit N.P.K	1 ml /1.5ml
Thyroxine / Greenzit S.P100 / Ascorbic acid	1 ml /0.2 g/1g
B.Seed treated with Thyroxine Preparation	
Thyroxine	1 ml
Thyroxine / Polymex / Potasin- F	1 ml /0.5 g/5ml
Baythroid / Greenzit N.P.K	2.5 ml/1.5ml
Potasin- F	5ml
Greenzit N.P.K	1.5 ml
Potasin-F/Greenzit N.P.K/Ascorbic acid	5 ml/1.5 ml /1 g
Season 2001	
Seed treated with bio-fertilizer "Microbin®"	
Baythroid / Polymex / Ascorbic acid	2.5 ml/0.5 g/1g
Baythroid / Greenzit S.P_{100}/ Ascorbic acid	2.5 ml /0.2g /1 g
Baythroid / Greenzit S.P_{100}	2.5ml/0.2g
Baythroid / Greenzit N.P.K	2.5 mll /1.5 ml
Baythroid / Greenzit N.P.K/Neem oil	2.5 ml/1.5ml/1 ml
Baythroid / Potasin-F / Greenzit N.P.K	2.5 ml /5 ml/1.5 ml
Baythroid / Polymex / Potasin-F	2.5 ml/0.5 g/5ml
Agerin / Thyroxine / Polymex / Ascorbic acid	1.25 g/1 ml /0.5 g/1g
Agerin / Thyroxine / Greenzit N.P.K / Neem Oil	1.25 g / 1 ml /1.5 ml /1ml
Agerin / Thyroxine / Greenzit S.P_{100}/Ascrbic acid	1.25 g /1 ml /0.2g /1g
Thyroxine / Polymex / Ascorbic acid	1 ml /0.5 g/5ml
Thyroxine / Greenzit N.P.K/Neem oil	1 ml/1.5 ml /1 ml
Thyroxine / Greenzit S.P_{100} /Ascorbic acid	1 ml /0.2 g/1g

Table (2): Effect of Sirene application and performed foliar sprays on the mean numbers of *Earias insulana* larvae per ten bolls throughout the growing cotton season of 1999 in Alexandria Governorate.

Foliar Treatments (Rate of application / L)	Mean number of larvae /10bolls
Baythroid / Polymex / Ascorbic acid 2.5 ml/0.5 g/1g	0.57abc
Baythroid / Greenzit $S.P_{100}$ 2.5ml/0.2g	0.52 ab
Baythroid / Greenzit N.P.K 2.5 ml /1.5 ml	0.29a
Baythroid / Greenzit $S.P_{100}$/ Ascorbic acid 2.5 ml /0.2g /1 g	0.33a
Baythroid / Potasin-F / Greenzit N.P.K 2.5 ml /5 ml/1.5 ml	0.71abcd
Potasin-F/Nitrate balancer 5 ml/20 ml	1.19de
Potasin-F/Greenzit N.P.K/Ascorbic acid 5 ml/1.5 ml /1 g	1.14cde
Neem oil 1ml	1.57ef
Agerin / Sirene® 1.25 g	1.04bcde
Neem / Agerin 1 ml /1.25 g	1.09bcde
Agerin 1.25g	1.61ef
Sirene®	1.95f
Untreated check	1.95f
F	***

F calculated = 14.844 F tabulated = 1.89

$L.S.D_{0.05}$= 0.416

Means followed by the same letter (s) are not significantly different at the 5% level.

Table (3): Effect of performed foliar sprays on the mean numbers of inspected *Earias insulana* larvae per ten bolls of the bio-fertilized cotton plants throughout the growing cotton season of 2000 in Alexandria Governorate.

Foliar Treatments (Rate of application / L)	Mean number of larvae /10bolls
Baythroid / Polymex / Ascorbic acid 2.5 ml/0.5 g/1g	0.47de
Baythroid / Greenzit S.P_{100} 2.5ml/0.2g	0.47de
Baythroid / Greenzit S.P_{100}/ Ascorbic acid 2.5 ml /0.2g /1 g	0.33e
Baythroid / Greenzit N.P.K 2.5 ml /1.5 ml	0.52cde
Baythroid / Potasin-F / Greenzit N.P.K 2.5 ml /5 ml/1.5 ml	0.90abcd
Baythroid -F/Greenzit N.P.K/Ascorbic acid 5 ml/1.5 ml /1 g	0.76abcde
Baythroid / Greenzit N.P.K/Neem oil 2.5 ml/1.5ml/1 ml	0.33e
Baythroid / Greenzit S.P_{100} / Potasin-F 2.5ml/0.2g/5ml	0.61bcde
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	1.04ab
Potasin-F/Nitrate balancer 5ml/20ml	0.57bcde
Potasin-F/Greenzit N.P.K/Ascorbic acid 5ml/1.5ml/1g	1abc
Thyroxine 1ml	0.52cde
Thyroxine / Polymex / Potasin- F 1ml/0.5g/5ml	1.19a
Thyroxine / Greenzit N.P.K 1ml/1.5ml	1abc
Thyroxine / Greenzit S.P_{100} / Ascorbic acid 1ml/0.2g/1g	0.90abcd
Untreated check	0.57bcde
F	***

F calculated = 3.25 F tabulated = 1.74

L.S.$D_{0.05}$= 0.41

Means followed by the same letter (s) are not significantly different at the 5% level

Table (4): Effect of performed foliar sprays on the mean numbers of inspected *Earias insulana* larvae per ten bolls of the growing plants from treated seeds by Thyroxine throughout the growing cotton season of 2000 in AlexandriaGovernorate.

Foliar Treatments (Rate of application / L)	Mean number of larvae /10bolls
Thyroxine 1ml	1.42a
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	1.04ab
Baythroid / Greenzit N.P.K 2.5 ml /1.5 ml	0.7bc
Potasin- F 5ml	1.04ab
Greenzit N.P.K 1.5ml	1.09ab
Potasin-F/Greenzit N.P.K/Ascorbic acid 5ml/1.5ml/1g	1.042a
Untreated check	0.57
F	***

F calculated = 6.02 F tabulated = 2.27
$L.S.D_{0.05}$= 0.371
Means followed by the same letter (s) are not significantly different at the 5% level.

Table (5) :Effect performed foliar sprays on the mean numbers of *Earias insulana* larvae per ten bolls throughout the growing cotton season of 2001in AlexandriaGovernorate.

Foliar Treatments (Rate of application / L)	Mean number of larvae /10bolls
Baythroid / Polymex / Ascorbic acid 2.5ml/0.5g/1g	0.38bc
Baythroid / Greenzit $S.P_{100}$/ Ascorbic acid 2.5ml/0.2g/1g	0.47abc
Baythroid / Greenzit $S.P_{100}$ 2.5ml/0.2g	0.42abc
Baythroid / Greenzit N.P.K 2.5ml/1.5ml	0.38bc
Baythroid / Greenzit N.P.K/Neem oil 2.5ml/1.5ml/1ml	0.23c
Baythroid / Potasin-F / Greenzit N.P.K 2.5ml/5ml/1.5ml	0.38bc
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	0.57abc
Agerin / Thyroxine / Polymex / Ascorbic acid 2.5ml/1ml/0.5g/1g	0.67ab
Agerin / Thyroxine / Greenzit N.P.K / Neem Oil 1.25g/1ml/1.5ml/1ml	0.52 abc
Agerin / Thyroxine / Greenzit $S.P_{100}$/Ascrbic acid 1.25g/1ml/0.2g/1g	0.61abc
Thyroxine / Polymex / Ascorbic acid 1ml/0.5g/1g	0.76ab
Thyroxine / Greenzit N.P.K/Neem oil 1ml/1.5ml/1ml	0.61abc
Thyroxine / Greenzit $S.P_{100}$ /Ascorbic acid 1ml/0.2g/1g	0.76ab
Untreated check	0.80a
F	*

F calculated = 1.873 F tabulated = 1.87
$L.S.D_{0.05}$= 0.350
Means followed by the same letter (s) are not significantly different at the 5% level.

Table (6): Effect of tested foliar treatments on the cotton yield infestation level of spiny bollworm infestation and yield losses of bio-fertilized plants during the growing season of 2000

Foliar treatments Rat of application /L.	Wight/feddan Kg.(Kent.)	% of spiny bollworm in festation	% Loss
Baythroid / Polymex / Ascorbic acid 2.5 ml/0.5 g/1g	2072 Kg. (13.2 kent.)	4.2%	10
Baythroid / Greenzit $S.P_{100}$ 2.5ml/0.2g	1504 Kg. (13.2 kent.)	4.2%	16.2
Baythroid / Greenzit $S.P_{100}$/ Ascorbic acid 2.5 ml /0.2g /1 g	2240 Kg. (14.2 kent.)	2.9%	18.4
Baythroid / Greenzit N.P.K 2.5 ml. /1.5 ml.	1568 Kg. (9.9 kent.)	4.6%	18.4
Baythroid / Potasin-F / Greenzit N.P.K 2.5 ml /5 ml/1.5 ml	1344 Kg. (8.5 kent.)	8.05%	9.04
Baythroid -F/Greenzit N.P.K/Ascorbic acid 5 ml/1.5 ml /1 g	1120 Kg. (7.1 kent.)	6.7%	21.7
Baythroid / Greenzit N.P.K/Neem oil 2.5 ml/1.5ml/1 ml	2160 Kg. (13.7 kent.)	2.9%	13.9
Baythroid / Greenzit $S.P_{100}$ / Potasin-F 2.5ml/0.2g/5ml	1328 Kg. (8.4 kent.)	5.5%	19.8
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	1648 Kg. (10.4 kent.)	9.3%	12.05
Potasin-F/Nitrate balancer 5ml/20ml	1184 Kg. (7.5 kent.)	5.08%	18.9
Potasin-F/Greenzit N.P.K/Ascorbic acid 5ml/1.5ml/1g	440 Kg. (2.7 kent.)	8.8%	49.6
Thyroxine 1ml	344 Kg. (2.1 kent.)	4.6%	49.1
Thyroxine / Polymex / Potasin- F 1ml/0.5g/5ml	592 Kg. (3.7 kent.)	10.5%	63.5
Thyroxine / Greenzit N.P.K 1ml/1.5ml	392 Kg. (2.5 kent.)	8.8%	74.3
Thyroxine / Greenzit S.P100 / Ascorbic acid 1ml/0.2g/1g	1176 Kg. (7.5 kent.)	8.05%	51.4
Untreated check	480 Kg. (3.04 kent.)	5.08%	57.6

Table (7): Effect of tested foliar treatments on the cotton yield infestation level of spiny bollworm infestation and yield losses upon plants grown fram seeds treated with thyroxine during the growing season of 2000.

Foliar treatments Rat of application /L	Wight/feddan Kg.(Kent.)	% of spiny bollworm in festation	% Loss
Thyroxine 1ml	512 Kg. (3.2 kent.)	19.4	70
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	680 Kg. (3.2 kent.)	14.2	16.9
Baythroid / Greenzit N.P.K 2.5 Ml /1.5 ml.	904 Kg. (5.7 kent.)	9.7	15.7
Potasin- F 5ml	344 Kg. (2.1 kent.)	14.2	87.3
Greenzit N.P.K 1.5ml	240 Kg. (1.5 kent.)	14.9	74.4
Potasin-F/Greenzit N.P.K/Ascorbic acid 5ml/1.5ml/1g	184 Kg. (1.1 kent.)	19.4	61.3
Untreated check	480 Kg. (3.4 kent.)	7.7	57.6

Table (8): Effect of tested foliar treatments on the cotton yield infestation level of spiny bollworm infestation and yield losses of bio-fertilized pants during the growing season of 2001.

Foliar treatments Rat of application /L	Wight/feddan Kg.(Kent.)	% of spiny bollworm in festation	% Loss
Baythroid / Polymex / Ascorbic acid 2.5ml/0.5g/1g	824 Kg. (5.21 kent.)	5.03	53.2
Baythroid / Greenzit $S.P_{100}$/ Ascorbic acid 2.5ml/0.2g/1g	528 Kg. (3.3 kent.)	6.2	55.6
Baythroid / Greenzit $S.P_{100}$ 2.5ml/0.2g	480 Kg. (3.04 kent.)	5.6	46.4
Baythroid / Greenzit N.P.K 2.5ml/1.5ml	536 Kg. (3.4 kent.)	5.03	32.07
Baythroid / Greenzit N.P.K/Neem oil 2.5ml/1.5ml/1ml	1120 Kg. (7.1 kent.)	3.1	26.3
Baythroid / Potasin-F / Greenzit N.P.K 2.5ml/5ml/1.5ml	624 Kg. (3.9 kent.)	5.03	38.2
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	832 Kg. (5.3 kent.)	7.5	32.4
Agerin / Thyroxine / Polymex / Ascorbic acid 2.5ml/1ml/0.5g/1g	344 Kg. (2.1 kent.)	8.8	54.7
Agerin / Thyroxine / Greenzit N.P.K / Neem Oil 1.25g/1ml/1.5ml/1ml	408 Kg. (2.5 kent.)	6.9	54.4
Agerin / Thyroxine / Greenzit $S.P_{100}$/Ascrbic acid 1.25g/1ml/0.2g/1g	352 Kg. (2.2kent.)	8.1	48.7
Thyroxine / Polymex / Ascorbic acid 1ml/0.5g/1g	296 Kg. (1.8 kent.)	9.4	43.5
Thyroxine / Greenzit N.P.K/Neem oil 1ml/1.5ml/1ml	304 Kg. (1.9 kent.)	8.1	46.7
Thyroxine / Greenzit $S.P_{100}$ /Ascorbic acid 1ml/0.2g/1g	256 Kg. (1.6 kent.)	10.06	71.9
Untreated check	304 Kg. (1.9 kent.)	10.6	61.5

Table (9): Effect of foliar treatments on crude and moisture content in seeds of bio-fertilized cotton plants during the growing season of 2000 .

Foliar treatments Rat of application /L	Crude fat% in fresh seed	Moisture content %
Baythroid / Polymex / Ascorbic acid 2.5 ml/0.5 g/1g	18.8	10.6
Baythroid / Greenzit $S.P_{100}$ 2.5ml/0.2g	16.4	10.4
Baythroid / Greenzit $S.P_{100}$/ Ascorbic acid 2.5 ml. /0.2g /1 g	16.5	10.8
Baythroid / Greenzit N.P.K 2.5 ml /1.5 ml.	15.6	10.9
Baythroid / Potasin-F / Greenzit N.P.K 2.5 ml /5 ml/1.5 ml	16.2	9.8
Baythroid -F/Greenzit N.P.K/Ascorbic acid 5 ml/1.5 ml /1 g	21.7	8.2
Baythroid / Greenzit N.P.K/Neem oil 2.5 ml/1.5ml/1 ml	20.5	9.7
Baythroid / Greenzit $S.P_{100}$ / Potasin-F 2.5ml/0.2g/5ml	18.2	8.9
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	20.0	9.9
Potasin-F/Nitrate balancer 5ml/20ml	19.6	11.3
Potasin-F/Greenzit N.P.K/Ascorbic acid 5ml/1.5ml/1g	18.2	9.8
Thyroxine 1ml	17.3	10.3
Thyroxine / Polymex / Potasin- F 1ml/0.5g/5ml	19.9	9.9
Thyroxine / Greenzit N.P.K 1ml/1.5ml	20.3	8.2
Thyroxine / Greenzit S.P100 / Ascorbic acid 1ml/0.2g/1g	20.5	9.1
Untreated check	20.5	10.4

Table (10): Effect of foliar treatments on crude and moisture content in cotton seeds of plants grown from treated seeds with thyroxine during the growing season of 2000 .

Foliar treatments Rat of application /L	Crude fat% in fresh seed	Moisture content %
Thyroxine 1ml	20.0	9.2
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	20.2	8.3
Baythroid / Greenzit N.P.K 2.5 ml /1.5 ml.	19.3	11.3
Potasin- F 5ml	17.0	10.4
Greenzit N.P.K 1.5ml	19.6	9.6
Potasin-F/Greenzit N.P.K/Ascorbic acid 5ml/1.5ml/1g	20.2	9.7
Untreated check	20.5	10.4

Table (11) Effect of foliar treatments on crude and moisture content in seeds of bio-fertilized cotton plants during the growing season of 2001 .

Foliar treatments Rat of application /L	Crude fat% in fresh seed	Moisture content %
Baythroid / Polymex / Ascorbic acid 2.5ml/0.5g/1g	19.1	11.0
Baythroid / Greenzit $S.P_{100}$/ Ascorbic acid 2.5ml/0.2g/1g	17.1	10.5
Baythroid / Greenzit $S.P_{100}$ 2.5ml/0.2g	16.9	10.7
Baythroid / Greenzit N.P.K 2.5ml/1.5ml	15.8	11.2
Baythroid / Greenzit N.P.K/Neem oil 2.5ml/1.5ml/1ml	20.6	9.9
Baythroid / Potasin-F / Greenzit N.P.K 2.5ml/5ml/1.5ml	19.1	9.1
Baythroid / Polymex / Potasin-F 2.5ml/0.5g/5ml	21.0	10.1
Agerin / Thyroxine / Polymex / Ascorbic acid 2.5ml/1ml/0.5g/1g	20.7	9.8
Agerin / Thyroxine / Greenzit N.P.K / Neem Oil 1.25g/1ml/1.5ml/1ml	21.3	9.2
Agerin / Thyroxine / Greenzit $S.P_{100}$/Ascrbic acid 1.25g/1ml/0.2g/1g	20.2	9.9
Thyroxine / Polymex / Ascorbic acid 1ml/0.5g/1g	21.0	9.5
Thyroxine / Greenzit N.P.K/Neem oil 1ml/1.5ml/1ml	21.6	9.8
Thyroxine / Greenzit $S.P_{100}$ /Ascorbic acid 1ml/0.2g/1g	19.7	11.0
Untreated check	19.0	9.8

REFRENCES

Abdalla, A.E. (1980). Some studies on oil from four cotton seed varieties. "Compositional quality and stability". M.Sc. Thesis Fac. Agric.,Helwan University. Egypt.

Abdalla, A.E. (1986). Fatty acids in seeds of sunflower and cotton. Ph.D.Thesis, Glasgow University. U.K.

A.O.A.C. (1973). Official and tentative methods of the American oil chemists society 350. Warekar driva Chicago, 1-11/inois.

Awad, H.A. (1982) Toxicological and histopathological studies of certain new group of pesticides against the pink bollworm and some of its beneficial enemies. Ph.D.Thesis, faculty of Agric., Menofiya Univ., shebin El- Kom, Egypt.

El-Naggar, A.Z. (1998). Evaluation of certain foliars and micro-elements in an Integrated Pest Management (IPM)program to control cotton bollworms M.Sc. Thesis, Fac. Agric.,(Saba-Bacha), Alex. Univ. Egypt

Khurana,S.,A.D.Khurana, and A.N.Verma (1994). Efficacy of synthetic Pyrethroids and conventional insecticides in controlling the pink bollworm *Pectinophera gossypiella* and their effect on plant phenology, yield and quality of cotton seed. Indian J.Entomol, 56(1):28-35.

Locke, L.F. and H.V. Eck. (1965). Iron deficiency in plants: How to control it in yards and gardens: U.S.D. A. Home and Garden Bull., 102-107.

Mahasen A. Abdel-Aziz (2002). The effect of Potassium Fertilizers; Ascorbic Acid and Salicylic acid on inducing resistance in cotton plants *Gossypium barbadense*. Against the spiny bollworm *Earias insulana* (Boisd.).2 interational Conference, Plant Protection Resarch Institute, Cairo, Egypt,21-24Decebmer,871-876.

Mahasen M.Ibrahim, Kh.A. Abdel-Rahman, and H.A.Awed.(2000). Evaluation of nine insecticides against the injurious insect-pests of cotton plants in El-Beheira Governorate.Adv.Agric. Res., 5(1):1263-1277.

Mesbah, H.A.,Mahasen M.Ibrahim, E.H. Tayeb, A.Z. El-Naggar, and Hanyiat M. El-Mimr (2000). Plant health, a new approach for the attainment of tolerant plants to pest infestation.(5):Effect of fertilization and foiiar appiication of nutritive elements on the infestation of cotton with bollworms. Adv.Agric. Res.,5(2): 1437-1454.

Masbah, H.A.,N.S. Haroun, E.H. Tayeb, A.Z. El-Naggar and Hanyiat M. El-Nimr (2001). Plant health, anew approach for the attainment of tolerant plants to plants to pests infestation. (6) Effect of plant spacing, fertilization type and foliar nutrients on the incidence of two sucking insect pests in cotton field. J. Adv. Agric.Res.; 6(2):441-461.

Michaal, Treshow (1970). Environment and plant response. Mc Grow-hill book company,pp.422.

Nimbalkar, S.A.,S.M.Khodke, Y.M.Taley, and K.J.Potill(1993). Bioefficacy of neem and Karanj seed extracts along with other commercial plant products against bollworms on cotton. Botanical pesticides in integrated pest management.252-255.

Purohit, M.S. and A.D.Deshpande (1994). Effects of ferilizeres on cotton bollworms in relation to plant protection. J.Maharashtra- Agricultural Universities, 19:172-174.

Sawan . Z.M, A. Hafez and A.E.Basyony (2001). Effect of Nitrogen and Zink Fertiligation and plant growth retardant on cottonseed pratein, oil yield and oil properties. JAOCS, 78(11); 1087-1091.

المخلص العربي

تأثير استخدام بعض المغذيات النباتية والمركبات الكيميائية البديلة على دودة اللوز الشوكية في محافظة الإسكندرية

حسن على مصباح[١] – السيد حسن تايب [١]– محمد محمد البسيوني[٢] – على زكريا النجار[٢]

(١) قسم وقاية النبات – كلية الزراعة (سابا باشا) جامعة الإسكندرية – مصر .

(٢) مركز البحوث الزراعية – معهد بحوث وقاية النبات – الإسكندرية – مصر .

تهدف تلك الدراسة الى تقييم تأثير المبيد الحشري (بايثروييد) وتسعة مركبات تشمل مغذيات نباتية وبعض بدائل المركبات الكيمائية والتى استخدمت أما بصورة فردية أو في تتابعات على نباتات مسمدة حيوياً لصنف قطن جيزة ٧٠ وذلك خلال مواسم ١٩٩٩–٢٠٠٠–٢٠٠١ ، وذلك ضمن برنامج المكافحة المتكاملة لدودة اللوز الشوكية بجانب دراسة تأثيرتها الجانبية على بعض خصائص المحصول مثل الانتاجية ، ونسبة الخسارة ، والنسبية الكلية للزيت والمحتوي الرطوبي للبذور وكانت النتائج المتحصل عليها كالآتي :

– أوضحت النتائج في موسم ١٩٩٩ أن استخدام التتابعات الثنائية أو الثلاثية للبايثروييد مع جرينزيت ن . فو . بو أو مع جرينزيت إس– بي ١٠٠ / حامض الأسكوربيك أظهرت كفاءة في خفض الاصابة بدودة اللوز الشوكية (٠,٢٩ ، ٠,٣٣ يرقة / ١٠ لوزات) على التوالي بينما كانت المعاملة بالسيرين أقل كفاءة في مكافحة الحشرة (١,٩٥ يرقة /١٠ لوزات) .

– أدى استخدام التتباعات الثلاثية بايثروييد / جرينزيت إس – بي ١٠٠ / حامض الأسكوربيك، بايثروييد / جرينزيت ن.فو . بو / زيت النيم الى كفاءة عالية في خفض الاصابة بدودة اللوز الشوكية في موسمي (٢٠٠٠ ، ٢٠٠١) وعلى العكس أدى استخدام الثيروكسين الى ارتفاع معدل الاصابة بالحشرة سواء كان في تتابع ثلاثي مع بوليمكس / بوتاسين – ف (موسم ٢٠٠٠) أو مع بوليمكس/ حامض الأسكوربيك (٢٠٠١) .

– وجد أن بذور القطن المنقوعة في محلول الثيروكسين لمدة ١٢ ساعة بمعدل ١ مل / لتر سجلت أعلى معدل اصابة وأعلى معدل خسائر في المحصول وأقل انتاجية في حالة استخدام الثيروكسين بمفردة أو مع المغذيات النباتية الأخرى المختبرة .

- أدى استخدام التتابع الثلاثي بايثروبد / جرينزيت ن .فو . بو / زيت النيم الى زيادة الانتاجية وانخفاض نسبة الاصابة في كلا الموسمين ، بينما أدى استخدام التتابعات الثلاثية الثيروكسين / جرينزيت ن . فو .بو أو ثيروكسين / جرينزيت إس . بي ١٠٠ / حامض الأسكوربيك الى انخفاض الانتاجية وارتفاع النسبة المئوية للاصابة في موسمي ٢٠٠٠ ، ٢٠٠١ على الترتيب ، وذلك في النباتات المسمدة حيوياً .

- استخدام التتابعات الثلاثية بايثروبد / بوتاسين –ف / جرينزيت ن . فو .بو ، بايثروبد / بوليمكس / حامض الأسكوربيك الى خفض معدل الخسارة في المحصول ، وذلك بالنسبة للنباتات المسمدة حيوياً (موسم ٢٠٠٠) ونفس النتائج تم التحصل عليها في موسم ٢٠٠١ عند استخدام التتابع الثلاثي بايثروبد / جرينزيت ن .فو . بو / زيت النيم .

- وعلى العكس أدى استخدام الثيروكسين في تتابعات ثنائية مع جرينزيت ن.فو .بو أو في تتابع ثلاثي مع جرينزيت ن . في . بي ثم زيت النيم الى ارتفاع نسبة الخسارة في موسمي ٢٠٠٠ ، ٢٠٠١ على الترتيب .

- أدى استخدام التتابع الثلاثي بايثروبد / جرينزيت ن . فو . بو / حامض الأسكوربيك والتتابع الثلاثي ثيروكسين / جرينزيت ن . فو . بو / زيت النيم الى ارتفاع النسبة المئوية للزيت في موسمي ٢٠٠٠ ، ٢٠٠١ على التوالي وذلك بالنسبة للنباتات المسمدة حيوياً ، بينما أظهرت باقي المعاملات قيم أقل أو مساوية للمقارنة .

- وعند تقدير المحتوي الرطوبي للبذور سجلت المعاملات نسبة أعلى او أقل بالنسبة للكنترول .

- بالنسبة للنباتات الناتجة من بذور معاملة بالثيروكسين . أوضحت النتائج أن كل المعاملات خفضت بدرجة أكبر أو أقل النسبة المئوية للزيت مقارنة بالكنترول ، بينما أدي استخدام التتابع الثنائي بايثروبد / جرينزيت ن . في . بي الى زيادة المحتوي الرطوبي للبذور مقارنة بباقي المعاملات