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RESPONSE OF COTTON PLANT TO SEED COATING WITH GAUCHO OR CRUISER AND THE EFFICIENCY OF THESE TREATMENTS ON SUCKING PESTS POPULATION

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ABSTRACT

Two field experiments were carried out at El-Gemmeiza Agricultural Research Station , El- Gharbia Governorate, Egypt, during 2010 and 2011 seasons to evaluate the efficiency of two systematic insecticides i.e Gaucho and Cruiser as seed coating before sowing at two rates against pests which attack cotton during seedling period (from emergence until 60 days old) as compared with untreated seed treatment (control), in addition to some physiological aspects (growth attributes, earliness, seed cotton yield, components and fiber quality) of the Egyptian cotton (*Gossypium barbadense*, L.), Giza 86 cultivar.

The obtained results could be summarized as follow:

1-Applying systematic pesticides ie. Gaucho and Cruiser as seed coating significantly increased leaf chlorophyll a, b and total chlorophyll contents, leaf area / plant, total dry weight / plant at 60 and 75 days old in both seasons and plant height at harvest and number of fruiting branches / plant in one season only compared with the control (untreated seeds with Gaucho or Cruiser).

2-Also, the two systematic pesticides significantly increased number of open bolls / plant, seed index, earliness % and seed cotton yield/ fed. in both seasons and boll weight in one season only as compared with the untreated control .

3-The tested treatments gave insignificant effect on micronaire reading and Pressley index in both seasons.

4-With regard to the effect of the rate used from the two systematic pesticides, the high rate of Gaucho or Cruiser increased the studied characters as compared to the low rate with one exception in the second season , where the low rate of Gaucho increased seed cotton yield / fed, as compared to the high rate of Gaucho.

5-In generally, Gaucho treatments i.e. 5 gm or 7 gm / kg seed gave the highest values of the studied characters as compared to the Cruiser treatments i.e 1 gm or 2 gm /kg seed.

6-The insecticidal activity of two neonicotinoides were studied as seed treatment at two rates against sucking pests *Thrips tabaci* (Lind.) and *Aphis gosspii* (Glover).Data indicated that the descending order of protective efficiency according to mean number of % reduction or the peak of activity of this insect were as follows: Gaucho with two rates , high rate of Cruiser and then the low rate of Cruiser. Therefore choosing will be according to economical consideration. i.e. availability of product and unit price. On the other hand , the physiological and botanical aspects differentiated between the rate of use of these products as follows , Gaucho 5g/kg seeds had positive effect and Cruiser with 2g/ kg seeds was better in this respect.

According to this study, the economical consideration , insecticidal efficiency and physiological and botanical aspects must be as three parameters in choosing the recommended insecticides .

Keywords:- Gaucho, Cruiser, seed treatment , Thrips , Aphids. cotton.

INTRODUCTION

Through cotton growth season, it is attack by many sucking pests : aphids, thrips and whitefly causing degrees and types of damage if not controlled.

Attention was therefore paid to control these serious insect pests by using systematic pesticides as seed coating before sowing as Gaucho and Cruiser which are considered nowadays as mainly good insecticides which gave good control. Almand 1995 reported that the Gaucho treated seed increased plant size and early square setting and resulted greater yield. But higher dose usually soften the plants with soluble nutrient and attracted the sucking and chewing pest of cotton. Epperlein and Jaschewski . 1997 reported that seed treatment on maize with imidacloprid (Gaucho) controlled aphid, *Rhopalosiphum padi* and resulted positive effects on plant height, plant weight, cob weight. Graham *et al.* 1995 evaluated Gaucho (imidacloprid) and Temik (aldicarb) on cotton in Mississippi during 1994.The results indicate the increased percent of square retention, total square counts and bloom counts. Herbert, 1998 found that the imidacloprid treated plants were taller and had more reproductive structures compared with untreated control. Cook *et al.* 1999 conducted field studies in Louisiana showed that Gaucho 3.84S [imidacloprid], So, improved performances of agronomic characters such as plant height, rooting length, and number of fruiting branches / plant, number of monopodia, flowering date, and number of bolls, boll weight, bolls split and number of harvest are important parameters in yield assessment.

The objective of this study are to :-

1-Minimize the rate of two insecticides namely, Gaucho and Cruiser to reduce control production cost without compromising yield.

2-Study the response of cotton Giza 86 variety to the low rate as compared to the recommended rate or untreated to assure the rate that gives the highest effect on leaf chemical composition , growth, earliness, yield and its components and fiber quality.

3-Find an explanation for this response on the bases of data obtained.

MATERIALS AND METHODS

Two field experiments were carried out at El-Gemmeiza Agricultural Research Station , El- Gharbia Governorate, Egypt, during 2010 and 2011 seasons to evaluate the efficiency of two systematic insecticides as seed coating before sowing at two rates against pests which attack cotton during seedling period (from emergence until 60 days old) as compared with untreated seed (control) was used as spraying with regard to leaf chemical composition , growth attributes, earliness, seed cotton yield and its components and fiber quality of the Egyptian cotton (*Gossypium barbadense* L.), Giza 86 cultivar. A randomized complete blocks design with four replicates was used in both seasons.

In both seasons the plot size was 14 m^2 ,(4m x 3.5m) including 5 rows 70 cm. wide and 4m. long and the hills space 25 cm. apart with two plants/hill after thinning . Sowing date was 1st April in the both seasons.

Phosphorous fertilizer was added at the rate of 22.5 kg. P_2O_5 / fed. as the calcium super phosphate (15.5 % P_2O_5) during land preparation. Nitrogen fertilizer in the form of ammonium nitrate (33.5% N) at the rate of 45 kg N / fed. was applied in two equal doses, immediately before the first and the second irrigations. Potassium fertilizer in the form of potassium sulphate (48% K_2O) at the rate of 24 Kg. K_2O / fed. was side – dressed in a single dose before the second irrigation. Standard agricultural practices were followed throughout the two growing seasons.

Soils of the experimental sites were sampled before planting and analyzed for soil characterization according to the procedures described by Jackson(1960). The results of the soil characterization are shown in table (1).

Table (1):Soil analysis of the experimental site in 2010 and 2011 seasons.

Properties	2010 season	2011 season
Texture	**Clayloam**	**Clayloam**
pH	7.6	7.5
Ecmmhos / cm	0.93	1.08
Ca Co_3 %	1.3	1.5
Cations Meg/L		
Ca^{++}	1.65	3.6
Mg^{++}	0.9	1.89
Na^{+}	6.58	7.47
K^{+}	0.24	0.35
Anions Meg / L		
Co_3^{--}	------	-----
HCo_3^{--}	2.27	2.7
Cl^{-}	4.32	6.61
SO_4^{--}	2.78	4.00
Available N (ppm)	30.7	21.1
Available P (ppm)	11.8	10.7
Available K (ppm)	410	360
Available Fe (ppm)	13.3	10.4
Available Mn (ppm)	11.5	9.1
Available Zn (ppm)	2.8	2.5
Available B (ppm)	0.5	0.45

Characters studied :

I- Leaf chemical composition :-

Leaf samples were obtained from the upper fourth node of the apex after 60 and 75 days old and the following constituents were determined i.e., chlorophyll a,b and total chlorophyll. These contents were determined following the method described by Arnon ,1949.

II-Growth attributes :-

In the two seasons, four plants of two guarded hills of the middle rows were taken at random from each plot after 60 and 75 days old. Samples were immediately transferred to the laboratory. Each sample was fractioned into four components, leaves, stems, branches and reproductive parts. The

fractions dried in an electric oven at 100C° for 24 hours and their dry weights were obtained and the following growth attributes were calculated:-

II.1. Top dry weight / plant (gm.)

II.2. Leaf Area (LA), the disc method was used according to Johnson(1967). The cross sectional area of the punch used was **0.015386 dm^2**.

$$LA / plant = \frac{\text{Leaves dry weight / plant} \times \text{disk area}}{\text{Disk dry weight}} \quad (dm^2)$$

Leaf area / plant was calculated as square decimeters. Blades of leaves only were used in calculating LA.

III- **Seed cotton yield and yield components:**

At harvest, data were taken from five random representative guarded hills from the second row of each plot to determine the following yield components:-

1- Plant height at harvest (cm.) 2- Number of fruiting branches / plant.
3- Number of open bolls / plant. 4- Boll weight (gm).
5- Lint percentage. 6- Seed index (gm)
7- earliness percentage: - percentage of first pick to total yield.
8- Seed cotton yield / fed. in kentars[1] was estimated from the yield of each plot in kilograms and transformed to kentars / fed.

IV- ***Fiber properties*** :- Micronaire value and Pressley index were determined at the laboratories of the Cotton Technology Research Division, Cotton Research Institute according to A.S.T.M (1975).

The data of the experiments were subjected to statistical analysis according to *Snedecor and Cochran (1981)* and the treatments means were compared using LSD values at 0.05 level of probability.

Entomological studies :

Insecticides : two neonicotinoides as commercial formulation were tested in the present study chloronictonyl , imidacloprid (Gaucho 70% W.S)and neonicotinoid, Thiamethoxam (Cruiser 70% W.S)

Field experiment: Field experiment was conducted at El Gemmeiza Agriculture Research Station, Gharbia Governorate for two cotton seasons 2010 and 2011 to evaluate the effectiveness of two neonicotinoid insecticides as seed treatment against two early season sucking pests (*Thrips tabaci* and *Aphis gosspii*). The experimental area was divided into 20 plots representing 2 insecticides x 2 rates x 4 replicates, in addition to 4 plots served as untreated check. . All plots were distributed in complete randomized block design.

Cotton seeds variety Giza 86 treated with insecticides imidacloprid (Gausho) at two rates (7and 5g /kg seed) and Thiamethoxam (Cruiser) at two rates (2and1g/kg seed) . Cotton seeds were sprinkled in plastic bowel moistened and mixed thoroughly with experimental insecticides until seeds were uniformly coated with insecticides. Seeds were dried in sun and sowing

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[1]. One feddan = 4200.83 m^2.
One kentar = 157.5 kg.

in experimental plots. After cotton emergence at 15 days, twenty five cotton seedling were examined after every 4 days interval till two months at early morning before sun shine for counting the number of thrips and aphids.
Percent reduction was calculated by (Henderson and Tilton, 1955) and Duncan's multiple range test was adopted to differentiate between overall means of all treatments.

RESULTS AND DISCUSSION

Leaf chloroplast pigments:

Data in table(2) show that leaf chloroplast pigments (chlorophyll a, b and total chlorophyll) were significantly affected by the tested treatments at 60 and 75 days old in both seasons, in favour of using Gaucho as seed coating when used at the high rate followed in decreasing order by the low rate of Gaucho, the high rate of Cruiser, the low rate of Cruiser and untreated. This result shows that the former treatment leaves were more active regarding their photosynthesis rates.

Leaf area / plant :-

Leaf area / plant at 60 and 75 days old was significantly affected by the tested treatments in both seasons, table (3) in favour of Gaucho at the high rate followed in decreasing order by Gaucho at the low rate, Cruiser at the high rate and at the low rate. However, the lowest values of leaf area / plant were obtained from the control treatment at 60 and 75 days old in both seasons. This result could be explained in view of the higher leaves number and dry weight of Gaucho treatments. The treatment of full level of Cruiser resulted in significantly higher leaf area per plant than those treated with the half rate of Cruiser or untreated.

Total dry weight / plant :-

Data presented in table (3) show that significant differences were found among the tested treatments in total dry weight per plant at 60 and 75 days old in both seasons, where in the first season the highest values of this trait (47.58 and 64.79 gm.) were obtained from using Gaucho at the high rate at 60 and 75 days old, respectively.

However, the lowest values (32.47 and 49.62 gm.) were obtained from the control treatment at 60 and 75 days old respectively. In the second season, the highest values of total dry weight (39.93 and 62.47 gm) were obtained from the high rate of Gaucho at the first and second growth ages, respectively, while the lowest values (30.36 and 53.90 gm.) were obtained from the control treatment at the first and second growth ages, respectively. From the same data, it could be noticed that Gaucho at the low rate increased total dry weight / plant as compared with Cruiser either at the low or high rate and the control treatment. The positive effect of Gaucho either at the low or high rates on dry matter accumulation is mainly due to :-

1-The positive effect of these two treatments on leaf chlorophyll content (table 2), the green pigments that capture light to produce food for the plant and perform the photosynthesis process which resulted in more

photosynthesis production and consequently increased dry matter accumulation.

2-The healthy seedling resulted from these two treatments characterized by active root zone, which resulted in more photosynthesis production due to quickly provide the necessary elements uptake in root zone and consequently increased dry weight / plant.

3-The significant increase in leaf area per plant due to Gaucho treatments as compared to the other treatments led to more active regarding their photosynthesis rates than poor ones.

Plant height and number of fruiting branches / plant :-

Data in table (4) show that plant height at harvest and number of fruiting branches / plant were significantly affected by the tested treatments in the first season only, in favour of using Gaucho as seed coating either at the low or high rates as compared with the control treatment (untreated seeds with Gaucho or Cruiser), where the differences among Gaucho and Cruiser treatments were insignificant. Also, the differences among Cruiser treatments and the control treatment were insignificant. The increase in plant height due to Gaucho treatments is mainly due to the increase in number of main stem nodes / plant which confirmed by the increase in number of fruiting branches / plant due to these two treatments. In this concern, Epperlein and Jaschewski . (1997) reported that seed treatment with Gaucho resulted positive effects on plant height. Herbert,(1998) found that Gaucho (Imidacloprid) treated plants were taller and had more reproductive structures compared with untreated control, and Hossain and Baqui,(2010) found that Gaucho treatment significantly affected the height range of plants of smooth variety of cotton . Gaucho 1.50 - 5.50 gm / kg seeds greatly increased plant height (87.25 to108.87 cm) compared to 71.37 cm in the control plots . Increasing dose of Gaucho gave taller plants. Number of fruiting branches / plant was significantly different among the Gaucho treated plants. It varied from 14.25 to27.63. The increasing doses of Gaucho increased the number of fruiting branches / plant compared to the untreated control which produced the lowest number (10.88) of fruiting branches / plant. In the hairy variety of cotton, plant height due to Gaucho treatment varied from 87.88-106.75 cm compared to 54.90 cm in control. 5.5g Gaucho gave significantly taller plants among the treatments. Number of fruiting branches / plant ranged from 14.0 to 27.12 in Gaucho treated plants. The increasing doses of Gaucho increased the number of fruiting branches / plant (27.12) and it was significantly higher in 5.5g Gaucho, While 11.87 was found in control.

Number of open bolls / plant :-

Data in table (4) show that number of open bolls / plant was significantly affected by the tested treatments in both seasons. Since, number of open bolls of plants received Gaucho or Cruiser as seed coating before sowing either at the low or high rates was significantly higher than that obtained from the control treatment. The highest values (24.3 and 25 bolls) were obtained from using Gaucho as seed coating at the high rate (7 gm / kg seed) in the first season and the low rate (5 gm/ kg seed) in the second season, respectively.

2-3-4

The highest number of open bolls due to these two treatments in mainly attributed to their positive effect on stimulating growth and increasing leaf area / plant, which surely reflected on increasing boll set. In this regard Hossain and Baqui (2010) found that Gaucho favored boll retention in plants of smooth variety of cotton 5.5 g Gaucho produced significantly higher number of bolls compared to the other doses i.e. 1.5,2.5,3.5 and 4.5 gm /kg seeds. The lowest number (11.25) was recorded from the untreated control. In the hairy variety of cotton, boll retention in Gaucho treated plants recorded as 19.50 -35.75 . Higher doses gave more retention while 11.75 was found in control .

Boll weight :

The tested treatments exhibited significant differences in boll weight in the first season only, where boll weight reached its maximum(3.38 gm.) when seed coating with Cruiser at the low rate(1 gm. / kg seed) followed by the high rate (7 gm / kg seed) of Gaucho, while the lowest value (3.21 gm) was resulted from untreated control . The increment of boll weight due to the two former treatments as compared with the latter treatment was mainly attributed to promote leaf development as confirmed by leaf area as shown in table (3) and associated photosynthetic activity of cotton plants and transport of the assimilates to various sinks In this concern , Hossain and Baqui (2010) found that in smooth variety of cotton, Gaucho 5.50g / kg seeds exhibited significantly higher boll weight compared to other doses of Gaucho (1.5 , 2.5 , 3.5 and 4.5 gm/kg seeds) and the untreated control . In the hairy variety of cotton, individual boll weight was recorded as 3.75 -4.70 gm in Gaucho treated plants compared to 3.42 gm in control. 5.5 gm Gaucho gave the highest boll weight with significant variation .

Earliness percentage:-

Earliness percentage was significantly affected by the tested treatments in both seasons (table 4). In the first season, the treatment of seed coating with the high rate of Gaucho significantly increased earliness % as compared with the other treatments. However, in the second season, the treatment of seed coating with Cruiser either at the low or high rates significantly increased earliness % as compared to the control treatment or the low rate of Gaucho . In this respect, Hossain and Baqui (2010) found that Gaucho had the favorable influence on the ripening of the crop of smooth variety of cotton . Increased doses of Gaucho decreased the number of days to harvest (2.50-3.25). 5.5g Gaucho harvested significantly earlier compared to untreated control. In hairy variety of cotton, crop was harvested earlier from all Gaucho doses compared to untreated control .

Seed cotton yield per fed. :-

Seed cotton yield / fed. was significantly affected by the tested treatments in both seasons table (4), in favour of applying Gaucho or Cruiser either at the low or high rates as seed coating as compared to untreated seeds with Gaucho or Cruiser, where the control treatment significantly decreased seed cotton yield/fed. by 18.16, 19.09 , 16.68 and 17.79 % ; 18.15 , 17.47 , 9.89 and 15.15 % as compared to applying Gaucho at the low rate or at the high rate or applying Cruiser at the low rate or at the high rate in the first and second season, respectively. The increase in seed cotton yield /

fed. due to seed coating with Gaucho or Cruiser as compared to the control (untreated seeds with Gaucho or Cruiser).

Mainly due to the following considerations:-

1-Applying Gaucho or Cruiser as seed coating improved plant area, leaf chlorophyll a, b and total chlorophyll content which surely reflected on better growth, improved flow of assimilates and accumulated dry weight in plant parts producing more health and vigorous plants as confirmed by the results in table (4).

2-Earlier seedlings protect from the injury by sucking pest insects i.e. aphids, thrips and whitefly which attack cotton during growth period from emergence until 60 days old led to healthy seedling characterized by root system enable to absorb nutrients from the soil with high efficiency and consequently increased dry matter accumulation and flowering oranges. This reflected on producing more bolls and high yield. However, in the control treatment where no Gaucho or Cruiser were used, the sucking pest insects attack cotton seedling and cause different injury symptoms.

With regard to rate effect, the data in table (4) show that the seed cotton yield was significantly increased due to the high rate of Gaucho in the first season without significant difference between this rate and the low rate compared with Cruiser either at the low or high rates, where the yield of the two former treatments were 11.29 and 11.42; 11.02 and 10.93 kentar / fed. as compared to the yield of the two later treatments which were 11.09 and 11.24; 10.01 and 10.63 kentar/ fed. in the first and second seasons, respectively.

Lint percentage :-

The tested treatments gave insignificant effect on lint % in both seasons table (5).

Seed index:

The tested treatments had a significant effect on seed index in both seasons table (5). The highest values of seed index (11.53 and 10.72 gm) were obtained from plants received the high or low rates of Gaucho as seed coating in the first and second seasons, respectively. The significant increase in seed index due to these two treatments as compared to the other treatments is mainly attributed to the increase in leaf chlorophyll content and leaf area / plant tables (2&3) which surely increases photosynthesis activity and metabolites accumulation with direct impact on seed index.

Micronaire reading and Pressley index:-

Micronaire reading and Pressley index were insignificantly affected by the tested treatments in both seasons table (5).

Conclusion

In view of yield data it could be recommended that the rate of 5 gm. Gaucho / 1 kg seed instead of the previous recommendation of 7 gm Gaucho/ 1 kg seed where the low rate of Gaucho led to positive effect on cotton chemical composition, and growth without risking in yield as compared wit the high rate of Gaucho. Also, it could be used Cruiser if Gaucho is enabled and the previous recommended rate i.e 2 gm Cruiser/ 1kg seed must

be used to obtain good growth and high yield as compared with the half rate or untreated.

Entomological studies :

The present studies were carried out using two compounds belongs to neonicotinoid insecticides against series two early sucking pests of cotton *Thrips tabaci* and *Aphis gossypii* at El –Gemmeiza Agriculture Research Station in two consecutive seasons 2010 and 2012 .

Data in table (6) and fig.(1) showed mean number and percent reduction of thrips cotton seedling during 2010 using two rates of imidacloprid (7 and 5 g/ kg seed) and Thiamethoxam (2,1 g / kg seed) as seed treatment at twelve tested periods . It is obvious, that number of thrips was increased gradually till 6^{th} periods , then decreased till 12^{th} tested period. The two rates (7 and 5 g) of Gaucho induced high reduction of thrips recording (91.57 and 91.91%) , (92.45 and 92.69%) and (93.67 and 93.81%) after 3^{rd} ,4^{th} and 5^{th} tested periods , respectively. On the other hand , the two rates of cruiser (2 and 1g) exhibit (78.61 and 86.67%) , (89.59 and 85.54%) and (91.92 and 85.56 %) after 3^{rd} ,4^{th} and 5^{th} tested periods , respectively.

Regarding the general mean of percent reduction, the two rates (7and5g/ kg seed) of Gaucho and the high rate of Cruiser (2g/kg seed) induced without Insignificant differences reduction 81.47, 81.92 and 78 .72%, respectively.

Data in Table (7) and fig (2) showed the same trend in the second year 2011 where Gaucho exhibited high effect in the two rates than Cruiser . Insignificant differences were observed between the two rates (7and 5 g/kg seed) of Gaucho causing (91.86 and 91.60%) , (91.34 and 90.78%) and (92.34 and 92.14 %) after 3^{rd} ,4^{th} and 5^{th} tested periods, respectively .While were (86.57 and 83.63 %) , (86.53 and 83.07%) and (86.01 and 84.68 %) after 3^{rd} ,4^{th} and 5^{th} tested periods, respectively for Cruiser.

According to general mean of percent reduction , Gaucho exceeded also Cruiser in its effects . Similar results were obtained by Ibrahim, 2004 , Dhandapani, *et al*. 2002 , Saleem, *et al*. 2003 , Karabhantanal, *et al*. 2007 , Kolhe, *et al*. 2009 , Thakara, *et al*.2009 and Lobna, 2012 . where they approved that Gaucho was highly effective against early season cotton pests

Data in table (8) and fig. (3) showed that number of aphis increase gradually in tested periods till reached maximum after 8^{th} tested period then decrease at the 8^{th} period and reached minimum after 12^{th} tested period. The two rates of Gaucho (7and 5g/kg seed) and Cruiser (2g/kg seed) induced insignificant difference in percent reduction of mean number of aphis at the tested three period 5^{th} , 6^{th} and 7^{th} recording (75.5 and 75.13 %) (79.91 and 79.91%) and (83.39 and 83.68%) for Gaucho and 71.94, 76.90% and 80.76 for Cruiser, respectively. On the other hand the lowest rate of Cruiser induced 68.82, 71.20% and 73.10% after 5^{th} , 6^{th} and 7^{th} periods, respectively.

As regards, the general mean of percent reduction, the tested two rate, of Gaucho exhibited a high percent reduction whereas the low level of cruiser induced the least effect in this respect.

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Data presented in table (9) and fig (4) indicated the mean number of aphis at the different tested periods in the 2nd season. As mentioned before the tested Gaucho induced high effect than Cruiser where caused (75.37 and 75.73%) , (79.81 and 80.13%) and (83.09 and 83.55%) for Gaucho after 5th , 6th and 7th period, respectively whereas Cruiser caused (72.16 and 69.31%),(75.64 and 71.15%) and (80.80 and 78.79%),reduction respectively. As for general mean of percent reduction, also Gaucho exceeded Cruiser in its effect without any significant difference .

These results were in agreement with those obtained by Dhandapani, *et al.* 2002 **,** Ibrahim ,2004 and Lobna, 2012.

Generally it could be concluded that the efficiency of Gaucho coincides with cotton chemical composition , plant growth analysis , yield components and some technological characters.

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استجابة نبات القطن لمعاملة البذرة بالجاوشو او الكروزر وكفاءة هذه المعاملات على تعداد الآفات الثاقبة الماصة

على السيد الجعبيرى* ، المدثر عبد العظيم وهبه والسيد جابر ابراهيم حمادة****

*** معهد بحوث القطن – مركز البحوث الزراعية – الجيزة - مصر**

****معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقى – جيزة – مصر**

أجريت تجربتان حقليتان فى محطة البحوث الزراعية بالجميزة محافظة الغربية خلال موسمى 2010،2011 م لتقييم كفاءة مبيدان حشريان جهازيان وهما الجاوشو (7 و5 جم/ كيلو بذرة) ومبيد الكروزر(2 و 1 جم/كيلو بذرة) كمعاملة للبذرة قبل الزراعة على تعداد آفتين تصيب نبات القطن وهما التربس والمن والتى تهاجم القطن فى مرحلة البادرة حتى عمر 60 يوم مقارنة مع البذرة الغير معاملة وذلك بالنظر الى التركيب الكيميائى ، دلائل النمو، التبكير ، محصول القطن الزهر ومكوناته وجودة الالياف لصنف القطن المصرى جيزه 86 .

أوضحت النتائج المتحصل عليها ما يلى :

١ - اعطت المعاملة بالمبيدات الحشرية الجهازية (الجاوشو و الكروزر) كتغطية للبذرة زيادة معنوية فى محتوى الورقة من الكلورفيل أ ، ب والكلورفيل الكلى ، مساحة الورقة للنبات ، الوزن الجاف الكلى للنبات عند عمر 60 و 75 يوم فى الموسمين كما أعطى زيادة معنوية فى طول النبات عند الحصاد وعدد الافرع الثمرية على النبات فى موسم واحد فقط مقارنة بالكنترول (عدم معاملة البذرة بكلا المبيدين السابقين) .

٢ - ايضا أعطى هذان المبيدان الجهازيان زيادة معنوية فى عدد اللوز المتفتح على النبات ، معامل البذرة ، النسبة المئوية للتبكير ، محصول القطن الزهر للفدان فى الموسمين ووزن اللوزة فى موسم واحد فقط مقارنة بمعاملة الكنترول

٣ - المعاملات المختبرة أعطت تأثير غير معنوى على قراءة الميكرونير ومعامل بريسلى فى الموسمين

٤ - بالنظر الى تأثير المعدل المستخدم من المبيدان الجهازيان فان المعدل العالى (7 جم/ 1كيلو بذرة) من الجاوشو أو الكروزر (2 جم/ 1كيلو بذرة) ادى الى زيادة الصفات المدروسة مقارنة بالمعدل المنخفض باستثناء واحد فى الموسم الثانى حيث ادى المعدل المنخفض من الجاوشو (5جم / كيلو بذرة) الى زيادة محصول القطن الزهر للفدان مقارنة بالمعدل العالى من الجاوشو (7جم /1 كيلو بذرة)

٥ - بصفة عامة معاملات الجاوشو (5 جم أو 7 جم / 1 كجم بذرة) اعطى أعلى القيم من الصفات المدروسة مقارنة بمعاملات الكروزر (1جم أو 2جم / 1كجم بذرة)

٦ - حشريا : تم دراسة النشاط الابادى لهذين المركبين بمعدليهما المذكورين سابقا على آفتى التربس والمن فى المراحل الاولى لنباتات القطن ، وأوضحت النتائج ان كلا المعدلين للجاوشو تفوقت فى قدرتها على خفض تعداد الآفتين عن معدلات الكروزر ، لكن معدل الكروزر (2جم/1كيلو بذرة) اعطى نتائج افضل حشريا وفسيولوجيا من المعدل المنخفض (1 جم /1 كيلو بذرة) وبناءا على هذه الدراسة فان المفاضلة بين هذه المركبات تنحصر فى ثلاثة اعتبارات

* اقتصادية (توفر المبيد وسعر الوحدة منه) * قدرته الابادية * تأثيره النباتى والفسيولوجى على محصول القطن .

التوصية:

فى ضوء نتائج المحصول فانه يمكن التوصية بالمعدل 5 جم جاوشو لكل 1 كيلو جرام بذرة بدلا من المعدل المصى به وهو 7 جاوشو لكل 1 كيلو جرام بذرة حيث اعطى المعدل المنخفض من الجاوشو تأثير ايجابى على التركيب الكيميائى لورقة القطن والنمو بدون فقد فى المحصول مقارنة مع المعدل العالى من الجاوشو ، وكذلك تبين من خلال الدراسة انه يمكن استخدام المعدل الموصى به من الكروزر 2 جم /1 كيلو بذره لأنه ادى الى نمو جيد للنباتات ومحصول عالى مقارنة مع نصف الجرعة أو بدون معاملة .

قام بتحكيم البحث

أ.د / محمود سليمان سلطان	**كلية الزراعة – جامعة المنصورة**
أ.د / مختار زكريا فوده عوض	**مركز البحوث الزراعية**

Table (2) : Effect of the tested treatments on leaf chloroplast pigments (mg / gm dray wt.) at 60 and 75 days old on 2010 and 2011 seasons.

Treatments		Chloroplast pigments (mg/g dw) at 60 days						Chloroplast pigments (mg/g dw.) at 75 days					
		Chlorophyll a		Chlorophyll b		T. Chlorophyll		Chlorophyll a		Chlorophyll b		T. Chlorophyll	
		2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
1- Control	(without Gaucho or Cruiser)	3.20	2.82	1.64	1.61	4.84	4.43	3.99	3.53	2.05	2.01	6.04	5.54
2-Gaucho	(5 gm / kg seed)	3.42	3.00	1.75	1.82	5.17	4.82	4.25	3.74	2.19	2.28	6.44	6.02
3-Gaucho	(7 gm / kg seed)	3.65	3.20	1.77	1.91	5.42	5.11	4.56	3.98	2.19	2.38	6.75	6.36
4-Cruiser	(1 gm / kg seed)	3.32	2.85	1.67	1.75	5.08	4.60	4.15	3.55	2.16	2.16	6.31	5.71
5- Cruiser	(2 gm / kg seed)	3.36	2.90	1.70	1.69	5.06	4.59	4.20	3.62	2.12	2.10	6.32	5.72
LSD 0.05		0.3	0.02	0.02	0.03	0.03	0.4	0.03	0.03	0.02	0.03	0.03	0.05

Table (3) : Effect of the tested treatments on dray weight (gm / plant) and leaf area (dm^2 / plant) at 60 and 75 days old on 2010 and 2011 seasons.

Treatments		At 60 days old				At 75 days old			
		Total dray weight (gm / plant)		Leaf area (dm^2/plant)		Total dray weight (gm / plant)		Leaf area (dm^2/plant	
		2010	2011	2010	2011	2010	2011		
1-Control	(without Gaucho or Cruiser)	32.47	30.36	19.56	17.59	49.62	53.90	22.91	24.25
2-Gaucho	(5 gm / kg seed)	47.40	39.19	21.91	19.40	62.74	60.49	30.13	29.12
3-Gaucho	(7 gm / kg seed)	47.58	39.93	23.64	20.34	64.79	62.47	30.54	29.65
4-Cruiser	(1 gm / kg seed)	41.86	36.41	20.48	18.43	61.51	58.95	26.42	27.69
5- Cruiser	(2 gm / kg seed)	42.77	36.52	21.74	18.59	62.28	60.41	30.04	28.15
LSD 0.05		2.06	1.99	0.92	0.43	2.22	1.15	0.84	0.40

Table (4) : Effect of the tested treatments on yield and yield components of Giza 86 cotton variety in 2010 and 2011 seasons.

Treatments		Plant height at harvest (cm)		No. of fruiting branches / plant		No. of open bolls / plant		Boll weight (gm)		Earliness %		Seed cotton yield (kentar/ fed.)	
		2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
1-Control	(without Gaucho or Cruiser)	172.5	153.7	17.8	15.3	19.5	20.3	3.21	2.99	59.89	68.6	9.24	9.02
2-Gaucho	(5 gm / kg seed)	183.9	171.2	19.10	16.30	23.10	25.00	3.31	3.14	61.27	68.10	11.29	11.02
3-Gaucho	(7 gm / kg seed)	181.9	161.2	19.4	16.8	24.3	24.5	3.34	3.08	62.92	70.3	11.42	10.93
4-Cruiser	(1 gm / kg seed)	176.3	155.0	18.7	15.8	23.3	23.3	3.38	3.05	61.48	71.7	11.09	10.01
5-Cruiser	(2 gm / kg seed)	178.8	161.2	18.9	16.5	23.6	24.3	3.32	3.06	61.80	71.4	11.24	10.63
LSD 0.05		7.8	NS	1.2	NS	1.5	1.6	0.10	NS	2.79	2.61	0.25	0.29

Table (5) : Effect of the tested treatments on lint %, seed index, micronaire reading and pressley index of Giza 86 cotton variety in 2010 and 2011 seasons.

Treatments	Lint %		Seed index (gm)		Micronaire reading		Pressley index	
	2010	2011	2010	2011	2010	2011	2010	2011
1-Control (without Gaucho or Cruiser)	40.3	40.00	10.52	10.50	4.7	4.63	9.9	10.16
2-Gaucho (5 gm / kg seed)	39.7	40.8	10.91	10.72	4.7	4.56	9.8	10.30
3-Gaucho (7 gm / kg seed)	39.6	40.7	11.53	10.40	4.8	4.73	9.9	10.13
4-Cruiser (1 gm / kg seed)	38.8	40.5	10.89	10.32	4.8	4.53	10.00	10.63
5- Cruiser (2 gm / kg seed)	40.8	41.2	10.67	10.24	4.8	4.46	9.00	10.63
LSD 0.05	NS	NS	0.42	0.30	NS	NS	NS	NS

Table (6) Mean number of thrips (*Thrips tabaci*) *and* % reduction on cotton seedling during 2010 season .

Compounds	Rate	No.	No. and % reduction of *T. tabaci* / 100 seedlings (DAP)												General mean
			1st period	2nd period	3rd period	4th period	5th period	6th period	7th period	8th period	9th period	10th period	11th period	12th period	
		%R	15DAP	19 DAP	23 DAP	27 DAP	31DAP	35 DAP	39 DAP	43 DAP	47 DAP	51 DAP	55 DAP	59 DAP	
Imidacloprid (Gaucho)	7 gm/1k seed	No.	17.5 c	21 c	23.5 c	23 c	22.5 d	49 c	57.25 b	59.75 b	62.5 b	49 b	35.5 cd	32.5 cd	37.75 c
		%R	87.20	89.58	91.57	92.45	93.67	90.30	81.32	70.24	64.49	67.60	78.15	71.11	81.47
	5 gm/ 1K seed	No.	20 c	21.75 c	24.5 c	23.75 c	23 d	40 c	55.5 b	55.75 b	61.25 b	48 b	34.75 d	30 d	36.52 c
		%R	85.37	89.21	91.91	92.69	93.81	90.55	81.89	72.23	65.19	68.26	78.62	73.33	81.92
Thiamethoxam (Cruiser)	2 gm/ 1K seed	No.	40.25 b	38 b	36 b	32.75 c	29.75 c	52.75 b	53.75 b	55 b	46 c	37 c	41.5 bc	37.5 bc	41.68 c
		%R	70.57	81.14	78.61	89.59	91.92	87.21	82.46	72.60	73.86	75.53	74.46	66.67	78.718
	1 gm/ 1K seed	No.	43.25 b	41 b	38.75 b	45.5 b	52.5 b	55.5 b	58.75 b	59.25 b	60 b	51.25 b	42.5 b	40 b	49.02 b
		%R	68.37	79.65	86.67	85.54	85.56	86.54	80.73	70.49	65.91	66.12	73.85	64.44	76.15
Control	--	--	136.75a	201.5a	290.5 a	314.75 a	363.5 a	412.5 a	206.5 a	200.75 a	176 a	151.25 a	162.5 a	112.5 a	227.41a
L.S.D	--	--	4.64	3.39	5.46	9.45	6.21	10.50	6.51	7.43	7.40	5.51	6.19	5.92	6.55

Means followed by the same letter in each column are not significantly at 5% level
DAP : Days after planting

Table (7) Mean number of thrips (*Thrips tabaci*) and % reduction on cotton seedling during 2011 season .

Compounds	Rate	No.	No. and % reduction of *T. tabaci* / 100 seedlings (DAP)												General mean
			1st period	2nd period	3rd period	4th period	5th period	6th period	7th period	8th period	9th period	10th period	11th period	12th period	
		%R	15DAP	19 DAP	23 DAP	27 DAP	31DAP	35 DAP	39 DAP	43 DAP	47 DAP	51 DAP	55 DAP	59 DAP	
Imidacloprid (Gaucho)	7 gm/1k seed	No.	21.25c	24 c	24.25 c	27.5 c	28.5 c	43.75 c	60 c	62.5 c	67.5 d	52.5c	40 b	35 c	40.56 c
		%R	84.82	88.43	91.86	91.34	92.34	89.71	81.12	70.59	64.47	67.19	64.14	54.84	78.40
	5gm/ 1K seed	No.	22.5c	23.75 c	25 c	29.25 c	29.5 c	46.25 c	61.25 c	58.75 c	71.25 c	49.75 b	42.5 b	36.25 bc	41.33 c
		%R	83.93	88.55	91.60	90.78	92.14	89.12	80.71	72.35	62.50	68.91	62.22	53.23	78.03
Thiamethoxam (Cruiser)	2gm/ 1K seed	No.	37.75b	40.5 b	40 b	42.75 b	52.5 b	58.75 b	65b c	67.5 bc	48.75 bc	42.5 b	37.5 b	32.5 b	47.16 bc
		%R	73.04	80.48	86.57	86.53	86.01	86.18	89.53	68.23	74.34	73.44	66.67	58.06	77.42
	1gm/ 1K seed	No.	43.75b	45 b	48.75 b	53.75 b	75.5 b	61.25 b	68.75 b	72.5 b	60 b	52.5 b	40 b	36.25 b	54.83 b
		%R	68.75	78.31	83.63	83.07	84.68	85.59	78.35	65.88	68.42	67.19	64.44	53.23	73.46
Control	--	--	140a	207.5 a	297.75 a	317.5 a	375.25 a	425 a	317.5 a	212.5 a	190 a	160 a	112.5 a	77.5 a	236.08 a
L.S.D	--	--	6.19	9.51	13.98	11.37	5.56	7.18	5.89	8.92	8.53	4.81	6.75	3.07	7.64

Means followed by the same letter in each column are not significantly at 5% level
DAP : Days after planting

Table (8) Mean umber of aphids *Aphis gossypii* and % reduction on cotton seedling during 2010 season .

Compounds	Rate	No.	No. and % reduction of *A. gossypii* / 100 seedlings (DAP)												General mean
			1st period	2nd period	3rd period	4th period	5th period	6th period	7th period	8th period	9th period	10th period	11th period	12th period	
		%R	15DAP	19 DAP	23 DAP	27 DAP	31DAP	35 DAP	39 DAP	43 DAP	47 DAP	51 DAP	55 DAP	59 DAP	
Imidacloprid (Gaucho)	7 gm/1k seed	No.	25.75 c	27 c	28.25 d	55.25 d	82.5 c	76.75 c	71c	63.75 c	57 c	49 c	41 d	36 b	51.10 c
		%R	73.39	81.94	86.05	79.49	75.50	79.91	83.39	82.30	80.73	79.30	76.97	66.29	78.77
	5 gm/ 1K seed	No.	26.75 c	27.75 c	29.5 d	56.5 d	83.75 c	76.75 c	69.75 c	64 c	58 c	52.25 c	42.75 d	37.5 b	52.10 c
		%R	72.35	81.44	85.43	79.03	75.13	79.91	83.68	82.37	80.39	89.78	76.40	67.64	79.46
Thiamethoxam (Cruiser)	2 gm/ 1K seed	No.	39.75 b	41.25 b	43 c	68.75 c	94.5 bc	88.25 c	82.25 c	75.75 c	62 c	61 c	52.5 c	40 b	62.41 d
		%R	58.91	72.41	78.77	74.48	71.94	76.90	80.76	79.05	76.50	74.23	70.50	64.04	73.20
	1 gm/ 1K seed	No.	42.5 b	47.5 b	52.5 b	78.75 b	105 b	110 b	115 b	106.25 b	97.5 b	96.5 b	96.25 b	43.75 b	82.62 e
		%R	56.07	68.29	74.07	70.78	68.82	71.20	73.10	70.61	67.03	59.24	45.93	60.67	65.48
Control	--	--	96.75 a	149.5 a	202.5 a	269.5 a	336.75 a	382 a	427.5 a	361.5 a	295.75 a	236.75 a	178 a	111.25 a	253.97 a
L.S.D	--	--	5.45	10.26	5.24	5.42	16.82	12.98	17.46	12.53	6.03	14.48	8.31	7.55	10.21

Means followed by the same letter in each column are not significantly at 5% level
DAP : Days after planting

Table (9) Mean number of aphids *Aphis gossypii* and % reduction on cotton seedling during 2011 season .

Compounds	Rate	No.	No. and % reduction of *A. gossypii* / 100 seedlings (DAP)												General mean
			1st period	2nd period	3rd period	4th period	5th period	6th period	7th period	8th period	9th period	10th period	11th period	12th period	
		%R	15DAP	19 DAP	23 DAP	27 DAP	31DAP	35 DAP	39 DAP	43 DAP	47 DAP	51 DAP	55 DAP	59 DAP	
Imidacloprid (Gaucho)	7 gm/1k seed	No.	27.5 c	29 c	30 c	58d	86.25 d	78.75 d	73.75 d	65 d	58.75 c	52.5 c	47.5 c	40 c	53.91 c
		%R	71.79	81.90	85.71	78.81	75.37	79.81	83.09	82.31	80.43	78.35	76.54	68.32	78.53
	5 gm/ 1K seed	No.	28.75 c	28.75 c	29.5 c	57.25 d	85d	77.5 d	71.75 d	64.75 d	60 c	53 c	52.5 bc	45 bc	54.47 c
		%R	70.51	81.45	85.95	79.08	75.73	80.13	83.55	82.38	80.02	78.14	74.07	64.36	77.94
Thiamethoxam (Cruiser)	2 gm/ 1K seed	No.	40 b	42.75 b	46.25 b	71 c	97.5c	95 c	83.75 c	77.5 d	64.75 bc	62.5 b	52.5 cb	47.5 bc	65.08 d
		%R	58.97	72.42	77.98	74.06	72.16	75.64	80.80	78.91	78.43	74.23	74.07	62.38	73.33
	1 gm/ 1K seed	No.	43.75 b	48.75 b	52.5 b	78.75 b	107.5 b	112.5 b	92.5 b	90 b	68.75 b	65.75 b	58.75 b	52.5 b	72.66 d
		%R	55.13	68.55	75.00	71.23	69.31	71.15	78.79	75.51	77.10	72.88	70.99	58.42	70.33
Control	--	--	97.5 a	155 a	210 a	273.75 a	350.25a	390 a	436.25 a	367.5 a	300.25 a	242.5 a	202.5 a	226.25 a	270.97 a
L.S.D	--	--	7.14	7.08	10.69	7.66	9.47	12.92	5.98	9.70	5.75	7.38	8.99	7.73	8.37

Means followed by the same letter in each column are not significantly at 5% level
DAP : Days after planting