Comparison between some Different Biofertilizers for there Efficiency on Sugar Beet Yield and Quality and Population Density of Sugar Beet Insects , Beet Fly *Pegomya Mixta* Vill. and Tortoise Beetle *Cassida Vittata* Vill

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ABSTRACT

Two field experiments were conducted at West Nubaryia region , North El-Tahrir at Al-Amel farm during the two growing seasons 2005/2006 and 2006/2007 to compare the efficiency of five different formulas Cerealine , Phosphorine , Microben, Bio- soil (B-S) and Commercial Alexandria Organic Compost (C.A.O.C.) of biofertilizers on yield and quality sugar beet and population density of insects. Data indicated that there were significant differences among biofertilizers on most yield , quality characteristics and reduced the attraction of beet fly, *Pegomya mixta* Vill and tortoise beetle, *Cassida vittata* Vill than control treatment . The Cerealine treatment was preponderate than other biofertilizers for most characteristic except for Phosphorine treatment in total soluble solids and sucrose percentage . There were significant differences between Cerealine and Phosphorine biofertilizers as well as between commercial bio-product "Bio-Soil " and Commercial Alexandria Organic Compost (C.A.O.C) in quality character. In both growing seasons , C.A.O.C was more attracted both beet fly, *P .mixta* and *C .vittata* (adults and larvae) while Cerealine biofertilizer was less attracted.

Biofertilizer C.A.O.C treatment was more attracted for *P .mixta* in two seasons while Cerealine bio-fertilizer was less attracted. The same trend was obtained by biofertilizer C.A.O.C and Cerealine which less attracted to *C.. vittata* while on attracted to *C .vittata* (adults and larvae) in both growing seasons.

Generally, it could concluded that applying of biofertilizer Cerealine in West Nubaryia region was preponderate to improve sugar beet characteristic as well as to reduce the infestation with the most important sugar beet key insect in Egypt and vice versa to apply C.A.O.C. These results had the important effect on reducing insecticides in sugar beet field, which is the main purpose of IPM program.

INTRODUCTION

Fertilizer is a substance added to soil to improve plants' growth and yield. Fertilizers typically provide, in varying proportions, the three major plant nutrients - nitrogen, phosphorus, and potassium, the secondary plant nutrients like calcium, sulfur, magnesium and sometimes trace elements or micronutrients like iron, zinc, copper and molybdenum. The long term use of fertilizers damages the soil texture and pH, soil structure and decreases beneficial soil microorganism. Biofertilizers are based on materials of vegetable, animal and microbial origin which contain certain macro, secondary or micro nutrients that can be utilized by plants after application to agricultural soils. Use of such biofertilizers in cultivation will help in safeguarding the soil health and also improve the quality of crop products. Phosphorus solubilizing bacteria and fungi play an important role in converting insoluble phosphatic compound such as rock phosphate, bone meal and basic slag particularly the chemically fixed soil phosphorus into available form (Phosphate solubilizing bacteria Bacillus & Pseudomonas). (Hillel, 2004). Phosphorus solubilizing bacteria and fungi play an important role in converting insoluble phosphoric compound such as rock phosphate, bone meal and basic slag particularly the chemically fixed soil phosphorus into available form (Phosphate solubilizing bacteria *Bacillus* & *Pseudomonas*). (Plaster, 2003). Composting is an excellent example of the practical use of biotechnology. It involves a highly complex biological process, involving many species of bacteria, fungi and actinomycetes, which coverts a low-value material into a higher value product. A wide range of bio-wastes can be composted including materials generated by agriculture, food processing, wood processing, sewage treatment, industrial and municipal waste. (Slater *et al.*., 2001).

World sugar production from sugar beet in 2005 was about 40 million tones which represents about 30 % of World production. Sugar beet is grown as a sugar source mainly in the industrialized countries of the northern hemisphere. It is planted in the autumn (October/November) and in the spring (March/April) was harvested. Production in a sub tropical environment would occur during the same months but would correspond to our autumn to spring with harvest in the spring (Weeden 2006). Sugar beet , as the second important sugar crops in Egypt after sugar cane , is growing in more than 54790 feddan which produced total crop beet of 260270 tons yielding 317470 tons sugar in 1999(Ministry of Agric. Sugar Crops Council , Cairo , Egypt , 1999) . In 2002/2003 , it has been grown in

190000 feddan and reached to more than 200000feddan . In 2003/2004 it produced about half million tons of sugar (Farag, 2003). It importance to agriculture is not confined only to sugar production , but also because it can be grown on a wide range of soils with medicine slightly heavy texture . Moreover , in most sugar beet regions , nitrogen and phosphorus are the most important fertilizers for normal growth and high yield of root and sugar as well (Salama and Badawi , 1996) Sugar beet plants attract numerous insects during the growing season. These insects have various needs of living . Beet fly, *Pegomya mixta* Vill and tortoise beetle , *Cassida vittata* Vill were among the major insects and caused lot of damage to sugar beet crop. The goal of this investigation is to decrease the dependent on mineral fertilizers and reduced the application of pesticides and pollution of agriculture environment.

MATERAILS AND METHODS

1-Biofertilizers used :

a- Cerealine: It contains nitrogen fixating .bacteria. The rate is 500 gm of Cerealine /4kg seeds /fed.

b-Phosphorine: Phosphorine is a bio-fertilizer containing very active bacteria for transformation unsuitable tri-calcium phosphate into mono-calcium phosphate .The applied rate is 300 gm of Phosphorine/4kg seeds /fed.

c- **Microben:** It contains high number of symbiotic and non-symbiotic Nitrogen Fixation bacteria for fixing atmospheric nitrogen which was carried on Peat Moss. The rate of application is 400 gm of Rhizobacterine/ 4kg seeds / feddan.

d- Commercial bio-product namely "Bio -Soil " (B-S) as bio-fertilizer, contains sulfate reducing bacteria (*Thiobacillus* sp.) and some nutrient elements
(Total N% 1.0 , P% 1.73 , K%.0.65 , Organic mater 32.17% , P_2O_5 3.5 % K_2O1.2%, CaO 5%, MgO 2.7% , Fe 1%, pH 8.0 , EC 3.0 and was obtained from El Sharkia Com. For Biofertilizers Industry, Giza city, Egypt. The rate of application is 5 ton/ / feddan.

e- Commercial Alexandria organic compost (C.A.O.C): (pH 8.7 , EC 2.95, N% 1. 5 , P % 0.45 , K %.1.29) was manufactured by Alexandria Fertilizers refuses from Alexandria town refuses . The rate of application is 6 ton/ / feddan.

f. Control Treatment : The 80 Kg nitrogen level / fed. was used as recommended dosage added as Ammonium Nitrate.

.3-Field experiments :

Two field experiments were conducted at West Nubaryia region , North El-Tahrir at Al-Amel farm during the two successive sugar beet winter seasons 2005/2006 and 2006/2007 . Before soil preparation, soil samples were taken at a depth of 30- 50 cm from different experimental sites, to determine chemical properties of soil according to Khan *et al.* (2001), Table (1).

Table (1) : Chemical properties of experimental soil during 2005/ 2006 and 2006/ 2007 seasons.

Type of analysis	2005/ 2006	2006/ 2007
E. C. (ds/ m^{-1})	0.40	0.62
Soluble cations (mq/ L) Mg^{++}	1.59	1.56
Na^{+}	4.40	3.25
K^{+}	0.51	0.82
Soluble anions (mq/ L) HCO_3^{-}	2.02	2.54
$SO4^{--}$	4.39	5.17
CL^{-}	4.68	5.58
Organic matter %_Total N%	0.09	0.12
P (p p m)	6.97	7.41
PH	8.10	8.13
Ca CO_3%	23.5	21.5

The glue was dissolved well in 1/2 liter of water. Sugar beet seeds of (Gloria variety) were thoroughly mixed with the previous glue solution. It

was left in shadow place for an hour, and then mixed with the tested bio-fertilizer. Sowing was started on November 15 in both seasons. The seeds were cultivated in one side of ridge in hills 20 cm apart (3-4 seeds /hill) using the dry method according to the inoculation .Four replicates were used for each treatment. A randomized complete block design was used . Each plot had 7 rows (each 5 m long and 50 cm apart) .The first sample of insect pests was taken after four weeks from sowing. Monthly, sample each consisted of twenty sugar beet plants (5 plants / replicate) , was randomly collected along the period of growing season. Each sample was put in plastic bag at different dimensions according to the status of plant growth to be transported to the laboratory. At laboratory, a moistened cotton pieces with ether was placed in the plastic bag for anesthetizing insects. The sampled plants were carefully examined for counting the total of tortoise beetle (adults and larvae) *C. vittata* . and beet fly (larvae) *P. mixta* .The plants were harvested after 210 days from sowing dates to determine the following parameters:

I- I- Growth characters :

1 - Root length (cm).
2 - Root diameter (cm)
3 - Weight of root / plant (gm).
4 - Weight of leaves/ plant (gm).
5- Plant weight (gm)
6- Leaf area index (L.A.I)

2-Technological Characterizes :

1- Sugar yield

S.Y. = Root yield (ton / fed.) x Sucrose %

2- Total soluble solids (T.S.S) was determined with a hand refractometer.

3- Sucrose percentage was determined according to the method described by Le- Docte (1927).

4- Purity percentage = $\frac{Sucrose \times 100}{T.S.S}$

was determined according to the method described by Carruthers and Old Field (1961).

RESULTS AND DISCUSSION

1- Growth characters :

The obtained results from this part of study as shown in Table (2) revealed that Cerealine bio-fertilizers found to be more effective than other bio-fertilizers on root length since gave the highest values in both seasons (43 & 44 cm/root). On the other hand , Microben gave the lowest values (32 & 29 cm) in the first and second season, respectively . The bio-fertilizers were little different significant affected on root length in two successive seasons .There were no significant differences between years.

Considering root diameter Bio-Soil (B-S) biofertilizer gave the highest values in the first season higher_(35.5 cm) while Cerealine recorded the highest value in the second season.(36cm). While microben recorded the lowest values in both seasons (30 cm and 27 cm), respectively. Regarding to leaves area index as shown in Table (2) , It could be noticed that Cerealine biofertilizer gave the highest values in leaves area in both seasons (1.71 and 1.72) while microben recorded the lowest values (1.43 and 1.44) . It was found also that no significant differences among Cerealine, Bio –Soil (B-S) and phosphorine treatment for leave area index. These results were harmony with Hassanein (2000) there obtained by sugar beet seed bio-fertilization significantly increased the yield traits i.e. root, top and sugar yield.

"Bio -Soil " (B-S) and Cerealine treatments were higher effected on root diameter characters (34.3 & 33.6 cm) than anther treatments , control , C.A.O.C., biofertilizers Microben and Phosphorine (25.8, 26.3 , 28.5 and 31 cm , respectively) as combined analysis data . Cerealine was preponderated on other treatments (33.5 & 36 cm) in two seasons, successively . Cerealine , "Bio -Soil " (B-S)and Phosphorine had no different significant variations among them in leaf area index (1.72, 1.68,and 1.67) as general mean values. In first and second seasons the effected of biofertilizers divided to four groups ,the first group was Cerealine (1.71and 1.72) , the second one was "Bio -Soil " (B-S) and Phosphorine (1.68, 1.68 and 1.68 , 1.66) , the third one was C.A.O.C (1.62 and 1.60) and last group was Microben and control treatment (1.43 , 1.44 and 1.4 , 1.42) in the 1st and 2nd seasons, respectively . There were significant differences between two growing seasons.

Data in Table (3) showed that bio-fertilizer Cerealine was high recorded the highest values of root weight (1545 and 1567 gm), meanwhile Microben recorded the lowest values of root weight character (1420 & 1386 gm) during 1st and 2nd seasons, respectively. The Bio Soil fertilizer had no significant different with Phosphorine treatment in the second season. Furthermore, there were significant differences between Bio-Soil and Phosphorine treatment in the first season.

In the first season, there were inequality among in all effected treatment. There was no significant difference between seasons . On other hand , The leaves weight was increased by applied all treatments in compared with control . Biofertilizer Cerealine was surpass on other treatments and recorded the highest values (750 & 765 gm) in both growing seasons . The Bio Soil (B-S) was the second effected on this character (680 & 725 gm) after Cerealine treatment in two seasons under the study . C.A.O.C was little increased the leaves weight (635 & 647 gm) than control (625 & 621gm) in two growing seasons. The plant weight character cleared from Table(3) that the plant weight significantly increased than control .These results were a harmony with those of Hassanein (2000) found that sugar beet seeds biofertilization significantly increased the yield traits i.e. root, top and sugar yields .The highest plant weight (2295 &2332 gm) were obtained from growing sugar beet plant under cerealine treatment during 2005/2006 and 2006/2007 seasons, respectively. Where , the lowest one was (1884 &1921.5 gm) obtained by growing sugar beet plant under the application of control treatments during the two seasons 2005/2006 and 2006/2007 , respectively . The increase than control in the plant weight of sugar beet plant were 2295 , 2157, 2108, 2075 and 2005 gm in the first season as well as 2332 , 2194 , 2125, 2046 and 2044g in the second season by growing sugar beet plants under biofertilizers of Cerealine, Bio-Soil (B-S) , Phosphorine, C.A.O.C and Microben , respectively as compared to growing sugar beet plant under control treatment. The present results are in harmony with the results which obtained by Osman (2005) and Ouda (2007) .

2- Quality character :

a- Total Soluble Solids T.S.S.%

Biofertilizers exhibited a significant effect on T.S.S.% in both seasons as well as in combined analysis (Table4) . Generally , biofertilizers significantly increased the T.S.S.% than control treatment. The results in

first season and combined analysis indicated that no significantly difference between the two biofertilizers, "Bio -Soil " (B-S)and C.A.O.C (20 & 19%). Also, there were significant differences among the other biofertilizers . The greatest of T.S.S. % values (23 , 23 and 23.11%) were obtained from sugar beet using biofertilizer Phosphorine in the first and second seasons and their combined analysis , respectively. On the other hand, the lowest values (17.5, 18.25 and 18.45 %)were recorded by biofertilizer Microben in both seasons and their combined analysis ,respectively.

b-Sucrose percentage:-

The results in Table (4) showed that sucrose percentage was significantly affected by biofertilizers in both seasons . It could be concluded that, using biofertilizers increased the sucrose percentage than control treatment. The results showed that no significant difference between Cerealine and Phosphorine as well as between "Bio -Soil " (B-S)and C.A.O.C .

c-Purity percentage :-

. Data presented in Table (4) there were no significantly effect in second season. These results were disagree with Azzazy, (2004) who found that root length, root yield sucrose % and purity% were effected significantly by increasing nitrogen level from 60 to 90 level . In the first season, there was significantly effect among Cerealine and another biofertilizers under this study .Whereas, in the combined analysis, the results stated that biofertilizers exhibited a significant effect on purity %. All tested different biofertilizers increased purity percentage from (78.5% to 83.29%). The data , also, showed no significant difference in purity percentage between Phosphorine and "Bio -Soil " (B-S)(79.53 &79.5) and between Microben and C.A.O.C.

d- Sugar yield:-

The data in Table(4) indicated that sugar yield significantly affected in the two grwoing seasons and in the combined analysis . Biofertilizer Cerealine transcend effect on sugar yield character (2.68 , 2.70 and 2.69 tons /fed) in two seasons and their combined analysis respectively. In the first season , the biofertilizers were significantly differences in sugar yield of root sugar beet .While in the second season there were no significantly differences among fertilizers without control treatments. The combined analysis was indicated the different influenced in sugar yield character.

2:- Effects of different biofertilizers on population fluctuation of sugar beet insects :-

2.1:- Beet fly *Pegomya mixta* Vill. :-

Results obtained in Table(5) indicated that larvae of *P .mixta* appeared after four weeks from sowing .During the first season 2005/2006 larvae began to appear in November ,population density of this pest reached (36 larvae / plant) during next month (December) . This results agree with El-Zoghbey, (1999) who found that the beet fly, *P .mixta* started to infest sugar beet plant after four weeks from sowing . The highest population density was reached in control treatment (46 larvae /plants) in March. In the second season *P .mixta* took the same trend which appeared in November 2006/2007 and in March reached to 51 larvae / plant). Biofertilizers effected in population density, whereas biofertilizer, Cerealine was less attracted (19.38 and 20.62 larvae / plant)to beet fly than other treatments in two successive seasons, successively. The all biofertilizers under study were less attracted such insect than control treatment in two seasons. These results were a harmony with those of Zarif, and Hegaz (1990) who found that *Pegomya mixta* larvae were more abundance as the rate of nitrogen was increased . Data in Table (5) appeared that biofertilizers exhibited a significant effect on expulsion beet fly *P .mixta*. C.A.O.C treatment was more attracted beet fly *P .mixta*. (26.86 and 26.76 larvae /plant) in two seasons , respectively. While bio-fertilizer Cerealine was less attracted (19.38 and 20.62 larvae / plant) in two successive seasons, respectively.

The results a harmony with the findings of Nabil *et.al* (2007) who found that biofertilizers caused the highest reduction to of aphids.

B:- Tortoise beetles *Cassida vittata* Vill.

Sugar beet is subjected to the attack of various insect pests which cause considerably damage to plant .The obtained data showed that the infestation started in February in the first season and January in second season in Phosphorine and Cerealine biofertilizers . These results agree with Salama and Elnagar (2002) who found that the outbreak of the tortoise beetle , *Cassida vittata* was observed in March to May. The effectiveness of bio-fertilizer treatments on population densities of *C. vittata* were shown in Table (5). Plants of the control treatment (did not receive any bio-fertilizer) were susceptible to infest by *C. vittata* (30.52 and 31.43 adults and larvae) in both seasons These results agree Abo El Ftooh (2002) reported that *C. vittata* started to infest sugar beet in February in two

seasons. On the other hand , Cerealine biofertilizers was more tolerance to infest by *C. vittata* (15.14 and 15.95 adults and larvae/ plant). Biofertilizer C.A.O.C was more attracted to *C. vittata* (28.43 &29.38 adults and larvae/ plant) in the two seasons follow them (26.52 & 27.00 adults and larvae/ plant).. These results are in accordance with those obtained by Ismail *et. al*,(2006) found that compost treatment reduced the population of the reniform nematode, *Rotylenchulus reniformis* and Abo El Ftooh (2002) found that biofertilizers were decreased the attracted *C. vittata* larvae and adults .

Finally , Cerealine biofertilizer was the best biofertilizer on sugar beet which increased the most physical characteristics and less attracted to sugar beet key insects, Viz., beet fly *P. mixta* and Tortoise beetles, *C.. vittata* .

In finely , Cerealine biofertilizer was the best treatment applied on sugar beet, which increased the most physical characteristics and less attracted to sugar beet insects Beet fly *P. mixta* and *C. vittata*

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Table (2):-The effect of some formula of bi-fertilizers on sugar beet physical properties on two successive seasons 2005/2006 and 2006/2007 .

Biofertilizers	Root length (cm)			Root diameter (cm)			Leaf area index		
	1st	2nd	C. analysis	1st	2nd	C. analysis	1st	2nd	C. analysis
Control	31b	25b	28 c	32 bc	26c	25.8c	1.40c	1.42c	1.41c
Microben	32b	29b	30.5 bc	30.5c	27bc	26.3c	1.43c	1.44c	1.44c
(C.A.O.C)	35b	35b	35b	35.5ab	29abc	28.5bc	1.60b	1.62b	1.61b
Phosphorine	34b	30b	31.2bc	31.5abc	32abc	31ab	1.68ab	1.66ab	1.67a
Bio -Soil (B-S)	35b	32b	33.5bc	43.5a	34ab	33.6a	1.68ab	1.68ab	1.68a
Cerealine	43a	44a	43.5 a	33.5abc	36a	34.3a	1.71a	1.72a	1.72a
Year means	35	33.8	34.4	29.1	30.7	29.9	1.56	1.59	1.59
$LSD_{0.05}$ between fertilizers	6.2	5.55	3.08	5.1	4.835	2.734	0.062	0.065	0.054
$LSD_{0.05}$ between seasons		N.S			1.578			N.S	

1st first season 2nd = Second season

Table (3):- The effect of some formulas of biofertilizers on Sugar beet characters during two growing seasons 2005/2006 and 2006/2007 .

Biofertilizers	Root weight (gm)			Leaves weight (gm)			Plant weight (gm)		
	1st	2nd	C. analysis	1st	2nd	C. analysis	1st	2nd	C. analysis
Control	1259f	1300c	1279.5c	625c	621.5c	623.3d	1884 b	2033 b	1902.8cd
Microben	1370e	1397c	1383.5c	635bc	647.5bc	641.3cd	2005b	2044b	2024.8c
(C.A.O.C)	1420d	1386b	1403b	655bc	660bc	657.5cd	2075b	2046 b	2060.5b
Phosphorine	1437c	1450b	1443.5b	671.3bc	675bc	673.1c	2108.3b	2125 b	2116.6b
Bio –Soil(B-S)	1477b	1469b	1522b	680ab	725ab	702.5b	2157b	2194 b	2245.5d
Cerealine	1545a	1567a	1556a	750a	765a	757.5a	2295a	2332 a	2313.5a
Season mean	1418.0	1428.2	1423.1	669.5	682.3	675.4	2086.6	2110.5	2098.5
$LSD_{5\%}$ between fertilizers	9.12	69.72	38.44	10.12	62.96	47.033	120.13	94.31	128.435
LSD5% between seasons		22.195	N.S	27.155			16.417	N.S	

1st first season 2nd = Second season

Table (4):- The effect of different biofertilizers on sugar beet quality during two growing seasons, 2005/2006 and 2006/2007 .

Biofertilizers	T.S.S %			Sucrose %			Purity %			Sugar yield Tons/fad.		
	1st	2nd	C. analysis	1st	2nd	C. analysis	1st	2nd	C. analysis	1st	2nd	C. analysis
Control	17c	18c	17.53c	13.6c	14.6b	14.1e	79.0b	78.0	78.50b	1.71d	1.9c	1.82d
Microben	17.5bc	18.25bc	18.45bc	13.9c	15.2b	14.6de	82.0b	82.0	82.2ab	1.90c	2.12b	2.03c
C.A.O.C)	19abc	19abc	19.00bc	15.6b	15.6b	15.6cd	80.0b	81.0	80.53ab	2.22d	2.16b	2.19c
Phosphorine	23a	23 a	23.11a	18.4a	18.6a	18.5a	80.0b	79.0	79.53b	2.64b	2.70b	2.67b
Bio-Soil (B-S)	20abc	21abc	20.50abc	16.0b	16.6ab	16.3bc	79.0b	80.0	79.50b	2.36c	2.44b	2.48b
Cerealine	22ab	22 ab	22.00ab	17.36a	17.2a	17.3b	85.6a	81.0	83.29a	2.68a	2.70a	2.69a
Season mean	19.75	20.33	20.04	15.80	16.29	16.05	80.96	80.17	80.56	1.40	1.34	1.37
LSD5% between fertilizers	3.375	3.746	2.505	1.264	2.041	1.119	3.07	4.85	2.634	0.049	0.088	0.075
LSD5% between seasons	N.S.			N.S.			N.S.			0.027		

Table(5):-Effects of different biofertilizers on population fluctuation of sugar beet insects *Cassida vittata* Vill and *Pegomya mixta* Vill. in 2005/2006 and 2006/2007 seasons.

Sugar beet insects	Months	Biofertilizers					
		Control	Microben	C.A.O.C	Phosphorine	Bio-Soil (B-S)	Cerealine
Pegomya mixta No. larvae / plant	November1st	19.00	18.33	9.60	14.00	0.00	237
	November2nd	0.00	18.67	0.00	16.33	0.00	5.33
	December1st	27.33	21.00	24.67	25.33	16.33	12.33
	December2nd	29.33	22.33	29.33	29.00	15.00	14.33
	January 1st	36.33	32.00	27..67	22.33	35.33	22.33
	January 2nd	36.67	32.00	28.00	22.67	36.33	24.67
	February 1st	41.00	35.33	27.67	35.00	39.00	28.00
	February 2nd	43.33	35.67	28.67	36.33	39.33	27.33
	March 1st	46.67	45.67	35.33	35.00	41.33	34.00
	March 2nd	51.67	46.00	50.00	34.67	42.33	34.00
	April 1st	25.67	24.00	17.33	20.33	22.33	25.33
	April 2nd	27.00	22.33	14.33	19.67	24.33	26.33
	May 1st	19.67	11.67	9.33	9.67	16.33	11.33
	May 2nd	17.00	10.33	7.33	9.00	16.67	12.33
Means	1st t season	30.81	26.86	20.66	23.09	24.38	19.38
	2nd season.	29.29	26.76	22.52	23.95	24.86	20.62
Treatment mean		22.45	22.62	21.33	20.83	20.61	19.16
LSD 0.05 between fertilizers 1st season		1.631 *	LSD 0.05 between fertilizers 2nd season		1.200		
LSD 0.05 between seasons		0.0579			N.S		
Cassida vittata No. of larvae and adults	November1st	0.00	0.00	0.00	0.00	0.00	0.00
	November2nd	0.00	0.00	0.00	0.00	0.00	0.00
	December1st	0.00	0.00	0.00	0.00	0.00	0.00
	December2nd	0.00	0.00	0.00	0.00	0.00	0.00
	January 1st	0.00	0.00	0.00	0.00	0.00	0.00
	January 2nd	0.00	7.00	0.00	12.00	0.00	0.00
	February 1st	37.33	17.33	29.00	23.33	35.33	10.00
	February 2nd	38.67	20.33	30.67	26.33	36.67	13.00
	March 1st	51.67	30.67	51.33	29.33	41.33	25.67
	March 2nd	55.00	29.00	52.67	30.00	44.33	22.67
	April 1st	59.33	33.67	55.67	41.33	48.67	30.67
	April 2nd	60.00	35.33	57.33	44.00	49.33	34.00
	May 1st	65.33	46.33	64.33	52.33	60.33	40.33
	May 2nd	66.33	49.00	65.00	56.33	62.67	42.00
Means	First season	30.52	18.29	28.43	20.90	26.52	15.14
	Second season.	31.43	20.09	29.38	24.09	27.00	15.95
Treatment mean		30.98	19.19	28.93	22.50	27.05	15.60
$LSD_{0.05}$ 1st between fertilizers		1.202	L $SD_{0.05}$ 2nd between fertilizers		1.689		
		$LSD_{0.05}$ 1st between seasons		N.S			

الملخص العربي

مقارنة كفاءة بعض صور الأسمدة الحيوية المختلفة علي محصول و جودة بنجر السكر و الكثافة العددية لذبابة البنجر *Pegomya* mixta Vill و خنفساء البنجر السلحفائية.Cassida vittata vill في غرب النوبارية

1- عادل أبو المعا طي أبو الفتوح-2 فايزة محمد أبو الفتوح الطويل 2- سحر فايز توفيق

١- قسم بحوث المحاصيل السكرية بالنوبارية- معهد بحوث المحاصيل السكرية - مركز البحوث الزراعية .

٢- محطة البحوث الزراعية بالصبحية(القصب)- معهد بحوث المحاصيل السكرية - مركز البحوث الزراعية

أجريت تجربتان حقليتان خلال الموسمين ٢٠٠٥/٢٠٠٦ و ٢٠٠٦/ ٢٠٠٧ في منطقة غرب النوبارية - شمال التحرير - مزرعة الأمل لقياس كفاءة تأثير خمس صور مختلفة من السماد الحيوي علي المحصول و صفات الجودة لبنجر السكر و كذلك الكثافة العددية لحشرتي ذبابة البنجر *P. mixta* و خنفساء البنجر السلحفائية *C. vittata* وقد أوضحت النتائج انه كانت هناك فروق معنوية لتأثير الأسمدة الحيوية على معظم الصفات المحصولية و الجودة وقد خفضت أيضا"معاملات الأسمدة الحيويةعلي انجذاب حشرتي ذبابة البنجر *P. mixta* و الخنفساء السلحفائية *C. vittata* عن المعاملة كنترول . تفوق السماد الحيوي Cerealine علي أنواع الأسمدة في التأثير علي معظم الصفات ما عدا السماد الحيوي Phosphorine في صفات الجودة مثل نسبة المواد الصلبة الكلية و نسبة السكروز . لا يوجد فروق معنوية بين السماد Cerealine و السماد الحيوي Phosphorine و كذلك بين السماد الحيوي Bio-soil (B-S) و السماد Commercial Alexandria Organic Compost (C.A.O.C) (مخلفات مدينة الإسكندرية) في التأثير علي صفات الجودة لمحصول بنجر السكر . و كان السماد الحيوي مخلفات مدينة الإسكندرية (C.A.O.C) كان أكثر الأسمدة جذبا" لذبابة البنجر و خنفساء البنجر السلحفائية وكان المعاملة السماد الحيوي Cerealine اقل الأسمدة الحيوية جذبا" لنفس الحشرتين.

عموما يمكن استنتاج ان السماد الحيوى Cerealine يمكن تطبيقة فى غرب النوبارية لتفوقة فى التأثير على صفات الجودة لمحصول بنجر السكر وأيضا لخفضة الأصابة بأهم حشرتين على بنجر السكر والعكس مع السماد الحيوى C.A.O.C . ومن هذه النتائج يمكن خفض تطبيق المبيدات لما لها من تأثير ضار على الصحة حيث انها أحدى اهم اهداف تطبيق المكافحة المتكاملة.