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RESPONSE OF SOME SUGAR BEET VARIETIES TO FOLIAR SPRAYING WITH COMPOST TEA AND ITS RELATIONSHIP WITH TWO SUGAR BEET INSECTS, BEET FLY, (*Pegomya mixta* Vill.) AND TORTOISE BEETLE (*Cassida vittata* Vill.) UNDER NEWLY RECLAIMED SANDY SOIL

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ABSTRACT: *Two field experiments were carried out in km 71 West Alexandria- Cairo desert Road during 2014/15 and 2015/16 seasons to study the response of some multigerm sugar beet varieties i.e., Top, Sultan and Kawemira to foliar spray with compost tea at three levels of (0, 15 and 20 L/fed/300 L water) at 45 and 75 days from sowing. The experimental design was a split plot design with three replicates, foliar spray with compost tea levels were arranged in the main plots and sugar beet varieties were allocated in the sub plots. The results showed that foliar spray with the level of 20 L/fed with compost tea significantly increased root length, diameter, fresh weight/plant, sucrose%, purity%, root and sugar yields/fed in both seasons, while, decreased root mineral contents (α amino N, Na and K %) as compared with zero treatment (control) or 15 L/fed level of compost tea.*

The Three tested varieties were differed significantly in the root length, diameter, fresh weight/plant, sucrose%, purity%, root and sugar yields/fed and root mineral contents. Kawemira variety surpassed the other two varieties (Sultan and Top) in the most traits in both seasons.

Foliar spray with compost tea increased the numbers of two sugar beet insects, beet fly (Pegomya mixta Vill.) and tortoise beetle (Cassida vittata Vill.). Kawemira variety was less attracted by the two previous insects, during two successive seasons.

Moreover foliar spray with compost tea at level 20 L/fed recorded the highest values for sucrose %, root and sugar yields/fed in both seasons. Generally, it could be recommended that sown Kawemira, Sultan and Top varieties, respectively and sprayed with 20 L/fed compost tea produced the highest sucrose%, root and sugar yields/fed and yield quality in a sandy soil.

***Key words**: compost tea – varieties of sugar beet – sugar beet insects.*

INTRODUCTION

Sugar beet plays a prominent role in sugar production. It is one of the most important sugar crops in the world. It ranks the second important sugar crops after sugar cane, producing annually about 40% of sugar production all over the world. In Egypt, it becomes the first source of sugar and shares 57% from total sugar production (sugar crops council 2016). It has been a large importance where there are wide newly reclaimed sandy soils (Mekki, 2014). Compost tea are compost – derived liquid products that may potentially induce positive effects on treated crops, including disease suppers sevens (defensibility) and bio stimulation of the overall improved plant status (pane *et al.* 2016). Compost tea is generally used in two ways: for plant disease treatment and for plant nutrition and growth promotion (Ganesan *et al*. 2015). In Egypt, El-Gizawy *et al*. 2014 found that sugar yield and Juice quality characteristics of sugar beet were significantly increased with compost tea treatments.

Also, there is great interest among sustainable growers about the use of

compost tea for increased crop health and fertility. Compost tea extracts prepared from composted manure, an organic farm composted, or cattle yard wastes, applied as foliar sprays, compost tea is used for two reasons: to inoculate microbial life into the soil or onto the foliage of plants and to add soluble nutrients to the foliage or to the soil to feed the organisms and the plants present. (Steve, 2009) Compost Tea revealed significant positive effects on tomato yield, biomass, and number of fruits in comparison to the control. (El-Hanafi Septi, 2005) moreover Compost Tea was used for controlling nematode, *Meloidogyne Javanca* (Maareg *et al*. 1999), disease *Botrytis Cinerea* (Welke 2005) and decreased nymphal survival when compost tea was applied to egg masses of *Halyomorpha halys* (Mathews and Barry 2014). Badr and Hilal (2009) found that foliar application of sugar beet plants with compost tea once time significantly surpassed those sprayed twice or three times compared to control plants in root and sugar yields (ton/fed), sucrose%.

Egyptian Government imports about 0.5 million ton of sugar, every year (Sugar Crops Council, 2016), to face the rapid increase of population. All sugar beet genotypes cultivated in Egypt are imported from foreign countries, so, it is preferable to evaluate them under Egyptian conditions especially under newly reclaimed soil, to evaluate them under different sowing dates and different harvesting dates to select the best suited ones. The differences between varieties in gene make up expression may be throwing some light on the relative importance of studying varieties behavior through the growing season. Osman *et al.* (2003) in Egypt, showed that Kawemira variety was superior in sucrose%, root and sugar yields/fed compared to Top, Lola and Pleno varieties. Aly (2006) found that Marathon variety surpassed significantly the other varieties for root length, diameter, fresh weight, root and sugar yields/fed. While, Kawemira variety was the best for sucrose%, purity%, extractable sugar% and extractability%. Ismail *et al.* (2006 & 2007) indicated that sugar beet genotypes differed significantly in growth, yield and quality characteristics in two seasons. Khalil (2010), Enan *et al* (2009), and Shalaby *et al*. (2008) tested several sugar beet varieties that differed significantly in root weight/plant, and sugar yields/fed in both seasons.

The aim of this, investigation, to study the effect of foliar spray with compost tea on yield and quality of some sugar beet varieties as well as the infestation with the main key sugar beet insects (*Pegomya mixta* Vill. and *Cassida vittata* Vill.).

MATERIALS AND METHODS

Two field experiments were carried out in a sandy loam soil at km 71 West Alexandria-Cairo desert Road during 2014/15 and 2015/16 seasons to study the response of some multigerm sugar beet varieties i.e., Top, Sultan and Kawemira to foliar spray with compost tea at three levels (0, 15 and 20 L/fed/300 L water).

The experimental design was a split plot design with three replications, foliar spray with compost tea levels were arranged in the main plots and sugar beet varieties in the sub plots. Compost Tea sprayed after 45 and 75 days from sowing. Compost tea is a liquid produced by leaching soluble nutrients and extracting bacteria from compost. Chemical analysis of compost tea in Table 1, Compost tea in commercial name, was provided from Microbiology Department, Agriculture Research Center, Ministry of Agriculture, Egypt. Plot size was 15.0 m^2 consists of 5 ridges, 6 m long, 50 cm apart and 20 cm between hills spacing. Plants were sowing in the 15th of October in both seasons and harvested when the outside leaves of these plants turned yellow (after 210 days from sowing). The previous crop was maize in both seasons. Nitrogen fertilizer at the rate of 80 kg N/fed was added in the form of ammonium nitrate (33.5% N) in two equals doses, the 1st one

after thinning and the other was applied at 2-week interval after the first application. A fixed dose of phosphorus was added in the form of calcium super phosphate (15.5% P_2O_5) at the rate of 100 kg P_2O_5/fed during land preparation. Potassium fertilizer was added in the form of potassium sulfate (48% K_2O/fed) at the rate of 50 kg/fed with the first dose of nitrogen fertilizer. Other agricultural practices required for growing sugar beet were carried out as usually practiced in the region. Some physical and chemical properties of the experimental soil were analyzed according to Jakson (1967) in Table 2.

Recorded data:

At harvest, ten plants were taken at random from each plot were harvested to determine the following traits:

A. Vegetative traits:

1. Root length (cm/plant).
2. Root diameter (cm/plant).
3. Root fresh weight (g/plant)

B. Quality traits:

Samples of ten roots were taken randomly, from each plot as fully cleaned roots and sent to Nile Sugar Company Lab to determine the following traits:

- Sucrose %
- Juice purity %
- Na , K and α amino N meq/100 g root

C. Productivity traits:

1. Root yield (ton/fed): plants of sugar beet from each plot were harvested topped to determine root yield as ton/fed on fresh weight basis.
2. Sugar yield (ton/fed) was calculated using the following equation:

Sugar yield (ton/fed)= Root yield x sucrose%.

D. Population density of sugar beet insects:

The first sample of insect pests was taken after four weeks from sowing. Monthly, each sample consisted of fifteen sugar beet plants (5 plants / replicate), was randomly collected along the period of growing season. Each sample was put in plastic bag and was 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 *Cassida vittata* (adults and larvae) and beet fly (larvae) *Pegomya mixta*.

The collected data were statistically analyzed according to Snedecor and Cochran (1981).

Table 1: Chemical analysis of the tested compost tea

EC (dSm^{-1})	pH	C	O.M	N	P	K	Fe	Mn	Zn	Cu
		(%)					(mg kg^{-1})			
2.75	7.33	12.0	31.0	1.89	0.54	2.31	122	76.0	53.0	31.0

Table 2: Some physical and chemical properties of the experimental soil

Particle size			Soil textural	E.C. ds/m	Soil pH (1:2.5)	Organic matter %	$CaCO_3$ %
Sand%	Silt %	Clay %	Sandy loam	4.10	8.75	1.81	1.50

Soluble Cautions (meq/L)				Soluble anions(meq/L)				available contents (ppm)		
Ca^{++}	Mg^{++}	Na^{+}	K^{+}	CO_3^{--}	HCO_3^{-}	Cl^{-}	SO_4^{--}	N	P	K
6.00	3.10	14.20	0.20	1.00	1.80	8.20	14.60	25.0	4.72	280.18

RESULTS AND DISCUSSION

I. Compost tea effects:

The results in Table 3 showed that application of compost tea at the level of 20 (L/fed) was more effective than 0 or 15 (L/fed), where, it gave the highest values for root length, diameter, fresh weight/plant, sucrose%, purity% and yields of root and sugar/fed, while, it gave the lowest values for root minerals contents (α amino N, Na and K %).

The increase in plant growth traits i.e. root length, diameter, fresh weight/plant and yields might be due to excessive vegetative growth by increasing foliar application levels of compost tea up to two sprays. Also, the increase in quality may be due to higher sucrose% and decreasing mineral contents led to increase in sugar yield/fed. The obtained results are in accordance with that reported by Steve (2009) who reported that compost tea led to decrease root mineral contents in root juice or improved the life in the soil and on plant surface. Also, similar results are coincided with those finding to El-Hanafi (2005), Badr and Hilal (2009) and El-Gizawy *et al*. (2014).

II. Varietal differences:

Results in Table 4 indicated that three sugar beet varieties significantly differed in the growth traits sucrose % yields/fed and minerals content in both seasons. Kawemira was the best variety than Sultan and Top where, it gave the highest values of (average root length, diameter, fresh weight/plant, sucrose%, purity%, root and sugar yields/fed) and the lowest values of the tested root minerals content percentage, i.e. α amino N %, Na% and K%.

This result might be due to the organic matter formed by photosynthesis, minerals % were lower and surplus sugars formed by photosynthesis for Kawemira variety were more than Sultan and Top varieties and the structure of gene make up. These results are in agreement with reported by Aly (2006), El-Sheikh *et al.* (2009), Enan *et al*. (2009), Khalil (2010) and El-Gizawy *et al*. (2014).

Table 3: Effect of foliar compost Tea on growth, quality, yields and root mineral contents at harvest during 2014/15 and 2015/16 seasons.

Compost Tea L/fed	Growth traits			Quality%		Root minerals content			Yields (ton/fed)	
	RL	RD	RFW	Suc.%	Pur.%	α amino N %	Na%	K%	RY	SY
2014/15 season										
0	29.26	12.50	916	15.35	76.75	1.81	1.50	5.39	27.42	4.21
15	30.42	13.50	930	16.50	82.56	1.68	1.42	5.27	28.40	4.69
20	31.00	13.90	1111	17.32	86.60	1.53	1.31	5.23	30.34	5.25
LSD at 5%	0.44	0.35	15.00	0.33	0.95	0.03	0.10	0.11	0.85	0.02
2015/16 season										
0	29.90	13.70	989	16.17	77.00	1.70	1.62	5.41	27.07	438
15	31.20	14.14	1067	17.19	81.86	1.53	1.55	5.29	28.83	4.95
20	32.80	16.09	1104	18.25	86.90	1.40	1.42	5.14	30.13	5.50
LSD at 5%	0.16	0.22	15.00	0.21	0.87	0.03	0.12	0.09	0.66	0.02

RL= root length (cm), RD = Root diameter (cm), RFW = root fresh weight (g/plant), Suc%.= Sucrose%, Pur.% = Purity%, α amino N, Na and K% = α amino N, sodium and potassium percentage.
RY = Root yield/fed and SY = Sugar yield/fed.

Table 4: Effect of varieties on growth, quality %, yields and root mineral contents at harvest during 2014/15 and 2015/16 seasons.

Sugar beet varieties	Growth traits			Quality%		Minerals content			Yields (ton/fed)	
	RL	RD	RFW	Suc.%	Pur.%	α amino N %	Na%	K%	RY	SY
2014/15 season										
Top	29.00	12.50	932	15.50	77.50	1.77	1.50	5.70	26.82	4.16
Sultan	30.30	13.20	970	16.52	82.60	1.69	1.41	5.34	28.78	4.75
Kawemira	31.40	14.20	1055	17.16	85.80	1.55	1.33	4.85	30.56	5.26
LSD at 5%	0.65	0.35	25.05	0.25	0.75	0.06	0.08	0.23	0.95	0.10
2015/16 season										
Top	29.70	13.53	948	16.24	77.33	1.82	1.61	5.60	26.57	4.31
Sultan	31.30	14.75	1062	17.07	81.29	1.50	1.53	5.24	28.82	4.92
Kawemira	32.90	15.65	1150	18.30	87.14	1.31	1.45	5.00	30.64	5.61
LSD at 5%	0.85	0.56	30.25	0.15	1.35	0.02	0.05	0.13	0.77	0.04

RL= root length (cm), RD = Root diameter (cm), RFW = root fresh weight (g/plant), Suc.= Sucrose%, Pur.% = Purity%, α amino N %, Na and K% = α amino N %, sodium and potassium percentage. RY = Root yield/fed and SY = Sugar yield/fed.

III. Interaction effects:

Data tabulated in Table 5 cleared that the interaction between foliar spray with compost tea levels and the three varieties significantly affected in sucrose%, root and sugar yields/fed. Kawemira variety gave the highest values of obvious traits under all compost tea levels. The results also found that the highest sucrose%, root and sugar yields/fed were obtained when sown Kawemira variety was sprayed with 20 L/fed compost tea as compared with other interactions in both seasons.

IV. Effects of composts tea levels on population density of two sugar beet insects:

1. Beet fly (*Pegomya mixta* Vill.)

Data in Table (6) clear that the highest total number of beet fly was recorded by 20 L/fed (198 & 269 larvae/plant) in the first and second season, respectively. While, the 0 L/fed was less attracted to beet fly (171&188 larvae / plant) in two seasons. The mean numbers in same table observed that there were not significant between the 0 L / fed and 15 L/fed in the first season. However, there was significant differences among the three mean compost tea levels (0, 15 and 20 L/fed) which was recorded 26.86, 33.0 and 38.43 larvae, respectively in the second season. These results were harmony with Abo El-Ftooh *et. al*. (2012) who found that using bio-fertilizers increased the number of beet fly. Data in (Table 6) showed also that the peak numbers of beet fly was obtained during March 40, 40 and 45 larvae /plant (in

the first season) and 55, 59 and 62 larvae /plant (in the second season) for 0, 15 and 20 L compost tea/fed, respectively. This result agrees with Abo El-Ftooh (2002) and Kandil (2016) who found that maximum numbers was recorded in March. The increasing of the tested insects under foliar spray with compost tea maybe return to the compost tea contains 31% organic matter and 1.89% nitrogen. These components increased the dose of nitrogen fertilizer, which may produce lush green plants (Gotyal *et al.* 2016) or it smell, which attracts these insects.

2. Tortoise beetle (*Cassida vittata Vill.)*

Data in Table (6) showed that *C. vittata* stated appeared in January in the first season while in the second season after applied the compost tea .The 20L/fed/300 L water was recorded the highest total number 153 & 166 larvae and adults /plant in the first and second seasons, respectively. On the other hand, the lowest total numbers were recorded (95 &105 larvae and adults /plant) at 0 L / fed in the first and second seasons, respectively. The 15 L/fed/300 L water level in the second season was less attracted to *C. vittata* through interval studied. This is due to the first number was registered in February at second season (9 larvae and adults /plant) which was less than the same period in the first season (22 larvae and adults /plant). This results agree with Abo El Ftooh *et al* (2007) and Kandil (2016) who found that the *C. vittata* was appeared in January and February. However, there were no significant differences for interaction between varieties and compost tea levels.

Table 5: Interaction between varieties and foliar application of compost tea on Sucrose%, Root yields and Sugar yields at harvest during 2014/15 and 2015/16 seasons.

Foliar application of compost tea L/fed									
Sugar beet varieties	Sucrose%			Root yields (ton/fed)			Sugar yields (ton/fed)		
	2014/15 season								
	0	15	20	0	15	20	0	15	20
Top	14.30	15.45	16.75	25.12	26.11	29.23	3.59	4.03	4.90
Sultan	15.65	16.80	17.10	27.57	28.35	30.42	4.31	4.76	5.20
Kawemira	16.10	17.25	18.11	29.57	30.75	31.37	4.73	5.28	5.65
LSD at 5%	0.35			0.10			0.16		
2015/16 season									
Top	15.00	16.23	17.50	24.45	26.75	28.50	3.67	4.34	4.99
Sultan	15.75	17.35	18.10	27.21	29.09	30.15	4.29	5.05	5.46
Kawemira	17.76	17.99	19.15	29.55	30.62	31.74	5.18	5.46	6.05
LSD at 5%	0.50			0.45			0.18		

Table (6): The effect of compost tea levels on population's density of *P. mixta* Vill. and *C. vittata* Vill. during 2014/15 and 2015/16 seasons.

Sugar beet insects	Months	Foliar application with Tea compost					
		2014/15 season			2015/16 season		
		0 L /300 L water/fed	15 L /300 L water /fed	20 L /300 L water/fed	0 L /300 L water /fed	15 L /300 L water/fed	20 L /300 L water/fed
P. mixta No larvae\plant	November	10	0	0	9	10	14
	December	21	25	30	22	28	33
	January	28	31	33	29	31	34
	February	39	41	44	33	38	46
	March	40	40	45	55	59	62
	April	22	25	28	30	43	50
	May	11	15	18	10	22	30
	Total numbers	171	177	198	188	231	269
	Mean	24.43	25.29	28.29	26.86	33.00	38.43
LSD $_{0.05}$ between levels		2.12			2.07		
LSD $_{0.05}$ between months		3.77			3.09		
C. vittata No larvae & adults \plant	November	0	0	0	0	0	0
	December	0	0	0	0	0	0
	January	3	6	10	0	0	0
	February	11	22	20	12	9	20
	March	21	30	32	25	36	40
	April	24	32	42	30	36	48
	May	36	45	49	38	51	58
	Total numbers	95	135	153	105	132	166
	Mean	13.57	19.29	21.86	15.00	18.86	23.71
LSD $_{0.05}$ between levels		2.09			2.21		
LSD $_{0.05}$ between months		3.11			3.42		

V. Effect of varieties on the population density of sugar beet insects:

1. Beet fly (*P. mixta* Vill.)

Sugar beet is subjected to the attack by various insect pests which cause considerable damage to plant. Results obtained in the first and second seasons (Table 7) indicated that larvae of *P. mixta was* appeared after four weeks from sowing. There were significant differences between varieties and monthly rate of infection. During December the highest population density of this pest reached (26.33 and 26.00 larvae / plant) in Top variety in two winter seasons 2014/15 and 2015/16, respectively. This results agree with Abo El-Ftooh (2002) and 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 (43.50 and 44.16 larvae/plant) in Sultan variety in March at the first and second seasons, respectively. The highest total number of population density was found in Top variety, whereas was more attracted (188.66 & 196.32 larvae/plant) during first and second seasons, respectively. On the other hand Kawemira variety was less attracted (114.3 & 150.98 larvae / plant) in first and second seasons, respectively.

Table (7): Effect of sugar beet varieties on populations density of *P mixta* and *C. vittata* Vil. in 2014/15 and 2015/16 seasons.

Sugar beet insects	Months	Sugar beet varieties					
		2014/15 season			2015/16 season		
		Top	Sultan	Kawemira	Top	Sultan	Kawemira
P. mixta No larvae\plant	November	16.5	9.16	6.65	8.16	9.33	2.66
	December	26.33	18.66	18.5	26.00	18.66	21.83
	January	29.33	33.66	25.00	32.83	34.16	26.33
	February	38.00	37.16	27.83	39.00	37.50	28.00
	March	40.83	43.5	34.66	44.00	44.16	42.00
	April	23.00	23.16	21.33	28.33	23.33	20.33
	May	14.67	14.00	10.33	18.00	13.50	9.83
	Total numbers	188.66	179.30	114.3	196.32	180.64	150.98
	Mean	26.95	25.61	16.33	28.04	25.80	21.57
LSD $_{0.05}$ between varieties		1.631			1.202		
LSD $_{0.05}$ between months		3.89			3.02		
C. vittata No larvae & adults \plant	November	0	0	0	0	0	0
	December	12.00	5.00	3.50	5.50	2.50	0
	January	13.00	1.50	11.50	11.00	8.50	8.50
	February	30.00	31.50	18.50	39.00	35.00	26.00
	March	50.50	46.00	32.00	54.50	46.16	39.00
	April	56.50	52.50	37.00	61.50	58.00	51.00
	May	63.50	62.00	45.00	68.50	66.00	57.5
	Total numbers	225.5	198.5	147.5	240	216.16	182
	Mean	32.21	28.36	21.07	34.28	30.88	26
LSD $_{0.05}$ between varieties		1.202			1.689		
LSD $_{0.05}$ between months		3.26			3.84		

2. Tortoise beetles (*C. vittata* Vill.)

Data in Table (7) showed that significant differences among sugar beet varieties and monthly rate of infection. The obtained data in Table (7) for the first and second seasons illustrated that the infestation started in December in Top, Sultan and Kawemir varieties (12, 5 and 3.50) & (5.50, 2.50 and 0 larvae and adults /plant), respectively. The population density of *C. vittata* increased from February until May. The maximum total number was reached in May (63.50 and 68.50 larvae and adults/plant) in Top variety followed by (62 and 66 larvae and adults/plant) in Sultan variety followed by (45 and 57.5 larvae and adults/plant) in Kawemira variety in first and second seasons, respectively. These results are partly consistent with Salama and Elnagar (2002) who found that the outbreak of the tortoise beetle, *Cassida vittata* was observed in March to May. How ever these results differed with these of Abo El-Ftooh (2002) who reported that *C. vittata* started to infest sugar beet in February in two seasons. On the other hand, Kawemira variety was more tolerance to infest by *C. vittata, the* monthly means was (21.07 and 26 adults and larvae/ plant) in the first and second seasons, respectively. Top variety was more attracted to *C. vittata* (32.21 and 34.28 adults and larvae/ plant) followed by Sultan variety (28.36 & 30.88 adults and larvae/ plant) in the first and second seasons, respectively.

Finally, it could be concluded that foliar spray with compost tea at level 20 L/fed recorded the highest values for sucrose %, root and sugar yields/fed in both seasons. Moreover, it could be recommended sowing Kawemira variety and foliar spray with 20 L/fed compost tea because of the highest sucrose%, root and sugar yields/fed and yield quality in a sandy loam soil and it also gained less attracted by *P. mixta* and *C. vittata* Vill. Moreover foliar spray with compost tea increased the numbers of two sugar beet insects, beet fly *P. mixta* and tortoise beetle *C. vittata*.

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إستجابة بعض أصناف بنجر السكر للرش بمنقوع الكمبوست وعلاقة ذلك بالكثافة العددية لحشرات بنجر السكر(ذبابة بنجر السكر وخنفساء بنجر السكر السلحفائية) تحت ظروف الأراضى الرمليه حديثة الإستصلاح

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الملخص العربى

أقيمت تجربتان حقليتان في ك 71 غرب الاسكندرية طريق اسكندرية – القاهرة الصحراوي 2015/2014 و2016/2015 فى تصميم القطع المنشقة مرة واحدة فى ثلاث مكررات وذلك لدراسة تاثير ثلاثة مستويات من الرش بمنقوع الكمبوست مرتين بعد 45 و 75 يوم من الزراعة (بدون (كونترول) ، 15 ، 20 لتر/300 لتر ماء/فدان) كسماد ورقى على نمو ومحصول وجودة ثلاثة أصناف من بنجر السكر (توب وسلطان وكاوميرا). وكذلك اثر ذلك علي بعض الحشرات التى تصيب بنجر السكر.

وكانت النتائج كالاتى:

1. أدى استخدام الرش الورقي بمنقوع الكمبوست بمعدل 20 لتر/300 لتر ماء/فدان إلى زيادة معنوية لكل من الصفات التالية وهى: طول وقطر والوزن الطازج للجذر والنسبة المئوية للسكروز والنقاوة ومحصول الجذور والسكر بينما نقص معنويا محتوى العناصر فى الجذور (الصوديوم والبوتاسيوم والألفا أمينو نيتروجين) بالمقارنة بالكنترول (بدون منقوع الكمبوست) فى كلا الموسميين.
2. اختلفت الأصناف معنويا فى صفات طول وقطر ووزن الجذر والنسبة المئوية للسكروز والنقاوة ومحصول الجذور والسكر ومحتوى العناصر فى الجذور. هذا وقد تفوق الصنف كاوميرا على كلا من الصنفين سلطان وتوب فى معظم الصفات السابقة فى كلا الموسميين.
3. كان للتفاعل بين معدل الرش بمنقوع الكمبوست 20 لتر/فدان والصنف كاوميرا تأثيرا معنويا على النسبة المئوية للسكروز ومحصولي الجذور والسكر طن/فدان حيث أعطى أعلى النتائج لهذه الصفات فى الموسميين.
4. أدى استخدام الرش بمنقوع الكمبوست الي زيادة جذب الخنفساء السلحفائية و ذبابة بنجر السكر الي نباتات بنجر السكر كما اظهر الصنف كوميرا انه اقل جذبا" للحشرتين تحت الدراسة خلال موسمي الزراعة حيث سجل اقل تعداد للحشرتين خلال موسمي الزراعة.
5. توصى هذه الدراسة برش أصناف بنجر السكر كاوميرا وسلطان وتوب على الترتيب بمنقوع الكمبوست بمعدل 20 لتر/فدان وذلك للحصول على أعلى محصول وجودة تحت ظروف الدراسة.