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EFFECT OF INTERCROPPING SYSTEMS AND POTASSIUM FERTILIZATION LEVELS FOR MAIZE WITH SOYBEAN CROPS ON SOME PIERCING SUCKING INSECTES

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ABSTRACT: ***This study was conducted to evaluate the effect of intercropping and potassium fertilization for maize with soybean plants on the population density levels of some piercing sucking insects at Diarb Negm distract Sharkia Governorate Egypt during 2017 and 2018 seasons. The results showed that intercropping system (1:1) and (3:3) maize with soybean decreased Rhopalosiphum maidis (Fitch), Rhopalosiphum padi (L.), Aphis gossypii (Glover), Empoasca decedens (Paoli), Empoasca decipiens (Paoli) , Cicadulina chinai (Ghauri), vibix (Haupt), Sogatella furcifera (Horv.) and whitefly, Bemisia tabaci (Genn.). The results indicate that increased of yield in the system (3:3). Data presented clearly that rate of 75 kg of potassium fertilization / fed. gave increased of yield maize with soybean plants and decreased infestation of some piercing sucking insects in both seasons.***

Key word: ***Maize, soybean, aphid, leafhopper, planthopper, whitefly, intercropping, potassium fertilization levels***

INTRODUCTION

The maize and soybean plants are important crops for the people in several regions of the world, including Egypt. Certain homopterous insects such as aphids, whitefly, leafhoppers and planthoppers are of great economic important pests which causes serious damage either directly by sucking plant juice or indirectly as vectors of virus diseases, Hashem (1997); El Gindy (2002); Youssef (2006) and Al-Habashy, Aml (2008). Companion cropping, which increases crop diversity, modifies the insects habitat interferes with the insects identification and responses to its host plant Tahvanainen and Root (1972). Root (1973) modifications that lead to the reduction of population of a pest have been referred to as cultural control. Okigbo and Greenland (1976) many farmers in the tropics practice companion cropping involving a few to several crops. Many authors studied the effect of intercropping system and fertilization level throughout certain crops combinations such as Perfect *et al*., (1978); Matteson (1982); Ezuech and Taylor (1984) and Rosseto *et al*., (1997) found that the fertilization (NPK) increased the numbers of aphid on cotton while aphid numbers decreased in absence of fertilizers and phosphorus. Application of potassium increased of population of *T. urticae,* which was reduced in the presence of hen manure. Watson *et al.,* (1994) studied the effect of three nitrogen fertilizer levels on the development of sweet potato whitefly (*Bemisia tabaci*) population infesting cotton plants and found that the nitrogen level had no effect on its development. Rao and Reedy (1999) this study was conducted to evaluate the effect of different intercropping maize with soybean on the infestation of pests and investigate the effect of potassium fertilization on the infestation levels of some pests. Intercropping is considered one of the safe and effective control agents which is successfully used in IPM

program of cotton pests. Bwala *et al.,* (2014) indicated significant effect of cropping pattern on number of pods/plant and grain yield. The Land Equivalent Ratio (LER) values generally showed advantages of intercropping, but higher advantages were obtained from maize introduction after two weeks of planting soybean. Kim *et al.,* (2018) pattern of corn and soybean seeding in rows at 5 cm distance was found suitable which provided adequate interrow distance to maintain enough mutual cooperation and decreased competition between both species for optimum production performance and nutritive value of intercropped forage.

This study was conducted to evaluate the effect of different intercropping maize with soybean on the infestation of some piercing sucking insects and investigate the effect of potassium fertilization on the infestation levels of some pests.

MATERIALS AND METHODS

Field experiment was carried out at Diarb- Nigm distract Sharkia Governorate, Egypt during the two growing seasons 2017 and 2018.

Intercropping systems and potassium fertilization.

To investigate the effect of intercropping and potassium fertilization for maize with soybean plants on the population density levels of some piercing sucking insects, the experimental design was split plot in all growing season, of maize and soybean plants. An area of about half fed, was divided into three replicates were used for each treatment. Each subplot consisted of 14 ridges (6 meters length and 60 cm width), in case of solid cultivation, one side of the ridges was planted with maize at 35 cm spaces, while one side of ridges were planted with soybean at 15 cm spaces, in case of first intercropping system (1:1), the second (3:3) included three ridges of maize: three ridges of soybean plants, respectively. In intercropping maize of Single cross 123 variety and soybean, Giza 22 variety were cultivated on the 2nd week of May in both seasons. The experimental area of fertilization was divided four treatments, 25, 50,75 kg of potassium sulphate (48 -50% k_2So_4) fertilization / fed. and control (without potassium fertilization). Normal agricultural practices were applied without pesticides treatments. Samples of leaves were taken weekly as previously mentioned in intercropping.

I-Sampling technique

a) Maize plants (*Zea mays* L.)

1- Aphid

Weekly, samples consisting of ten leaves and five tissues from different intercropping and solid were taken at randomly from different levels of plants after four weeks from sowing date (2nd week of May) until harvest (first of September). These samples were kept in tightly closed paper bags and then transferred to the laboratory for examination on the same day with the aid of a stereomicroscope. The numbers of aphid was counted.

2- Leafhopper and planthopper insects.

Each sample consisted of 100 double strokes by sweeping net was taken randomly from both diagonal of the field. The samples were taken weekly to counted leafhopper and planthopper insects. The samples were transferred to the laboratory and leafhopper and planthopper insects were counted.

b) Soybean plants

1- Aphid and whitefly

Weekly, samples consisting of 25 leaves from different intercropping and

solid were taken randomly from plants after four weeks from sowing date (2nd week of May) until harvest (first of September). These samples were kept in tightly closed paper bags and then transferred to laboratory from examination of the same day with the aid of a stereomicroscope. The numbers of aphid and whitefly (nymph and adult) were counted on two surfaces.

2-leafhopper insects

Each sample consisted of 100 double strokes by sweeping net was taken random from both diagonals. The samples were taken weekly to counted leafhopper insects. The samples were transferred to the laboratory and leafhopper insects were counted.

We are used the Costat software program (2005) to analysis the data of insect species.

RESULTS AND DISCUSSION

1-Effect of intercropping system

a) Maize plants

1- Aphid species

Data in Table (1) showed that the maize plants intercropping with soybean were infested by three aphid species *R. padi*, *R. miadis* and *A. gossypii.* The average numbers of *R. miadis* were 1583.47, 922.82, 834.6 individuals / sample in the first season and 1001.73 , 543.62, 496.15 individuals /sample in the second season, respectively. On the other hand, the population density of *R. padi* were 694.96, 435.31, 385.43 and 625.02, 325.83, 296.14 individuals /sample in both seasons. But the average numbers of *A. gossypii* were 96.55, 65.73, 61.85 and 80.71, 64.86, 61.49 individuals / sample at solid, 1:1 and 3:3 (maize: soybean) for the two seasons, respectively. The results revealed that intercropping system decreased the population density of *R. maidis*, *R. padi* and *A. gossypii* compared with solid. The solid was influenced, the occurrence of aphid species highly significantly in compared with intercropping maize with soybean. Hegab *et al*., (1987) ; Youssef (2006) and Habashy, Aml *et al.,* (2012) who found that aphid species *R. maidis , R. padi* and *A. gossypii* in maize field.

2-Leafhopper and planthopper insects

Three leafhopper species *E. decedens, E. decipiens* and *C. chinae* were recorded in maize. The solid was influenced, the occurrence of leafhoppers highly significantly in compared with intercropping maize plants. The population density of *E. decedens* was 44.95, 38.28, 36,43 and 47.54, 41.33, 38.51 individuals / sample in both seasons, respectively. On the other hand, the population density of *E. decipiens* were 52.18, 42.17, 40.23 individuals / sample in the first season and 55.22, 49.25, 47.19 individuals / sample in the second season, mean while population density of *C. chinae* were 43.94, 36.43, 34.55 and 41.73, 36.30, 34.35 individuals / sample in both seasons, respectively. The average numbers of *S. vibix* were 46.68 , 39.21, 37.82 individuals / sample in 2017 season and 45.48, 38.01, 36.48 individuals / sample in 2018 season, while mean numbers of *S. furcifera* were 45.84 , 39.29, 37.47 and 44.51, 37.78, 36.03 individuals / sample in both seasons at solid, 1:1 and 3:3 (maize: soybean), respectively . Youssef (2006) and Habashy, Aml *et al.,* (2012) who found that *E. decedens, E. decipiens, C. chinae*, *S. vibix* and *S. furcifera* in maize field

b) Soybean plants

1) Aphid

Data in Table (2) showed that the soybean plants intercropped with maize were infested by one aphid species, *A. gossypii.* The average numbers of *A. gossypii* were 55.90, 40.13, 32.29

Table (1): Effect of different intercropping on the infestation of maize plants by certain piercing sucking insects along with yield during 2017 and 2018 seasons.

intercropping	Aphid / sample						Leafhopper /sample						Planthopper / sample				Mean yield kg/plot	
	R. maidis		*R. padi*		*A. gossypii*		*E. decedens*		*E. decipens*		*C. chinae*		*S. vibix*		*S. furcifera*			
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
solid	1583.47 a	1001.73 a	694.96 a	625.02 a	96.55 a	80.71 a	44.95 a	47.54 a	52.18 a	55.22 a	43.94 a	41.73 a	46.68 a	45.48 a	45.84 a	44.51 a	25.15 c	33.54 c
1:1	922.82 b	543.62 b	435.31 b	325.83 b	65.73 b	64.86 b	38.28 b	41.33 b	42.17 b	49.25 b	36.43 b	36.30 b	39.21 b	38.01 b	39.29 b	37.87 b	36.25 b	45.60 b
3:3	834.6 c	496.15 c	385.43 c	296.14 c	61.85 c	61.49 c	36.43 c	38.51 c	40.23 c	47.19 c	34.55 c	34.35 c	37.82 c	36.48 c	37.47 c	36.03 c	43.23 a	52.25 a
P.	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
LSD 0.05	22.45	17.500	25.38	28.29	2.89	3.96	0.92	0.69	0.69	0.71	0.61	0.70	0.63	0.65	0.71	0.83	5.651	7.276

Table (2): Effect of different intercropping on the infestation of soybean plants by certain piercing sucking insects along with yield during 2017 and 2018 seasons.

intercropping	Aphid/ sample		Leafhopper/ sample						Whitefly / sample		Mean yield kg/plot	
	Aphis gossypii		*E. decedens*		*E. decipiens*		*C. chinae*		*B. tabaci*			
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
solid	55.90 a	40.25 a	18.17 a	14.71 a	14.88 a	12.81 a	9.07 a	7.46 a	71.85 a	91.21 a	11.35 c	15.24 c
1:1	40.13 b	29.21 b	12.12 b	9.31 b	12.50 b	10.00 b	8.25 b	7.58 b	53.66 b	61.15 b	16.10 b	18.60 b
3:3	32.29 c	23.78 c	11.02 c	9.04 c	10.71 c	9.25 c	6.95 c	6.34 c	50.85 c	57.59 c	19.14 a	22.45 a
P.	**	**	**	**	**	**	*	*	**	**	**	**
LSD 0.05	0.53	0.57	0.40	0.39	0.33	0.27	0.33	0.31	0.44	0.41	1.061	1.154

P. = probability

individuals / sample in the first season and 40.25, 29.21, 23.78 individuals /sample in the second season at solid, 1:1 and 3:3 (maize : soybean), respectively. El – Gindy (2002); Youssef (2006) and Abd- Elsamed *et al.,* (2011) found that aphid species *A. craccivora* and *A. gossypii* in leguminous and soybean plants.

2) Leafhopper

Data in Table (2) cleared that three leafhopper species *E. decedens, E. decipiens* and *C. chinae* were found. The intercropping was influenced, the occurrence of leafhoppers, *E. decedens* and *E. decipiens* highly significantly and significantly with *C. chinae* compared with solid Soybean plants in both seasons, respectively. The population density of *E. decedens* was 18.17, 12.12, 11.02 and 14.71,9.31, 9.04 individuals / sample in both seasons, respectively. On the other hand, the population density of *E. decipiens* were 14.88, 12.50, 10.71 individuals / sample in the first season and 12.81, 10.00, 9.25 individuals / sample in the second season, mean while population density of *C. chinae* were 9.07, 8.25, 6.95 and 7.46, 7.58, 6.34 individuals / sample at solid, 1:1 and 3:3 (maize : soybean), respectively in both seasons, respectively.

3) Whitefly

Data in Table (2) cleared that the soybean intercropping system with maize decreased the population density of whitefly compared with solid the means population density of *B. tabaci* were 71.85, 53.66, 50.85 and 91.21, 61.15, 57.59 individuals/sample solid, 1:1 and 3:3 (Soybean: maize), respectively. Ezuech and Taylor (1984) showed that intercropping cowpea after 12 weeks from maize planting, significantly reduced insect damage thus determining the best system for intercropping maize with cowpea. Omar *et al.,* (1991) and Omar *et al.,* (1994) intercropping of cotton with cowpea significantly influenced the spread of *A. gossypii, E. dicipiens* and *B. tabaci*. Suggesting that the presence of cowpea plant with cotton could result in a reduced population build up of these insect. El- Gindy (2002) and Abd- Elsamed *et al.,* (2011) surveyed the aforementioned homopterous insects on leguminous and soybean plants. Rahimi *et al.,* (2013) study the effect of soybean and corn intercropping system on diversity and abundance in some natural enemy and herbivorous insect

families under farm conditions. Results showed that the population in some of these natural enemy and herbivorous insect families is significantly influenced by intercropping system, so that the maximum number of natural enemy insects and the minimum number of herbivorous insects. Bwala *et al.,* (2014) indicated significant effect of cropping pattern on number of pods/plant and grain yield. The Land Equivalent Ratio (LER) values generally showed advantages of intercropping, but higher advantages were obtained from maize introduction after two weeks of planting soybean. Mansour *et al.,* (2017) the study the effect of okra intercropped with maize. Data obtained recorded that the piercing sucking pests, *T. usurticae*, *A. gossypii* and *B. tabaci* and the results revealed that okra intercropped with maize in alternating rows (1:1), proved to be the most efficient intercropping system, where the lowest infestation of different pests compared to the control (the monoculture system) and the other cropping system in the two governorates. Moreover, rows (1:1) recorded the best pod yield of 78.9 & 75.9 kg / karat in Majazer and Quaha. Kim *et al.,* (2018) pattern of corn and soybean seeding in rows at 5 cm distance was found suitable which provided adequate interrow distance to maintain enough mutual cooperation and decreased competition between both species for optimum production performance and nutritive value of intercropped forage.

Mean yield (Kg/plot).

Tables (1 and 2) showed that yield of maize plants was affected significant by intercropping. (3:3) system was recorded the highest mean of yield was recorded (43.23) and (52.25) Kg/plot in the two seasons, respectively. While solid system was recorded (25.15) and (33.54) Kg/plot in 2017 and 2018 seasons, respectively. The same phenomenon took place with soybean plant, yield (3:3) system was recorded (19.14) and (22.45) Kg /plot significant with solid system (11.35) and (15.24) in the first and second seasons, respectively.

2) Effect of fertilization:

Three level 25, 50, 75 kg / fed. of potassium were applied as soil fertilization and control (without potassium fertilization) to study their effects on the population density of some injurious pests attacking maize and soybean plants during two successive growing seasons of 2017 and 2018 . The obtained results could be discussed as follows:

a) Maize plants

1) Aphid

Data in Table (3) showed that the effect of potassium fertilizer on the infestation degree of maize plants with aphids *R. maidis, R. padi and A. gossypii*) were statistically highly significant in both seasons. The lowest average numbers of this pest (*R. maidis)* was recorded in F4 (75 kg potassium fertilization / fed.) in both seasons 950.17 and 594.22 individuals / sample, respectively, while the average numbers of *R. padi* were 415.49 and 323.86 individuals / sample occurred on leaves of maize plants by F4 during the two seasons respectively. On the other hand the numbers of *A. gossypii* were 59.35 and 55.86 individuals /sample occurred on leaves of maize plants by F4 during the two seasons, respectively. Whereas, the highest average numbers of 1268.91and 778.74 individuals / sample (*R. maidis*) occurred on leaves of maize plants by F1 (without potassium fertilization), while the average numbers of *R. padi* were 594.52 and 514.35 individuals / sample occurred on leaves of maize plants by F1 during the two seasons respectively. On the other hand the numbers of *A. gossypii* were 90.62 and 80.33 individuals /sample occurred on leaves of maize plants by F1 during the two seasons, respectively.

Table (3): Effect of different levels potassium fertilization on the infestation of maize plants intercropping with soybean plants by certain piercing sucking insects along with yield during 2017 and 2018 seasons.

Fertilization	Aphid insects						Leafhopper insects						Planthopper insects				Mean yield kg/plot	
	R. maidis		*R. padi*		*A. gossypii*		*E. decedens*		*E. decipens*		*C. chinae*		*S. vibix*		*S. furcifera*			
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
F1	1268.91^{a}	778.74^{a}	594.52^{a}	514.35^{a}	90.62^{a}	80.33^{a}	45.92^{a}	50.91^{a}	50.60^{a}	57.44^{a}	44.32^{a}	44.09^{a}	46.13^{a}	45.22^{a}	45.94^{a}	45.76^{a}	18.12^{d}	21.32^{d}
F2	1167.17^{b}	712.55^{b}	535.51^{b}	452.05^{b}	78.31^{b}	73.80^{b}	42.60^{b}	45.26^{b}	47.03^{b}	53.17^{d}	40.24^{b}	40.72^{b}	43.37^{b}	41.89^{b}	42.17^{b}	40.54^{b}	32.60^{c}	35.72^{c}
F3	1062.49^{c}	636.49^{c}	475.42^{c}	385.72^{c}	70.57^{c}	66.09^{c}	37.72^{c}	39.72^{c}	43.30^{c}	47.29^{c}	35.56^{c}	34.00^{c}	39.39^{c}	37.70^{c}	39.37^{c}	37.62^{c}	40.32^{b}	49.56^{b}
F4	950.17^{d}	594.22^{d}	415.49^{d}	323.86^{d}	59.35^{d}	55.86^{d}	33.31^{d}	33.96^{d}	38.52^{d}	44.31^{d}	33.07^{d}	31.02^{d}	36.08^{d}	35.15^{d}	35.99^{d}	33.96^{d}	51.17^{a}	60.13^{a}
P.	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**
LSD 0.05	25.93	20.21	29.31	32.66	3.33	4.58	1.06	0.79	0.79	0.82	0.71	0.81	0.73	0.75	0.82	0.95	4.126	5.097

2) Leafhopper and Planthopper:-

Data in Table (3) cleared the effect of potassium fertilizer on the infestation degree of maize plants with three leafhopper and two planthopper were statistically highly significant in both seasons. The lowest average numbers of leafhopper *E. decedens, E. decipiens* and *C. chinae* were 33.31, 38.52 and 33.07 insects/sample occurred on leaves fertilized by F4 (75 kg potassium fertilization / fed.) in the first season respectively, but in the second seasons the lowest average numbers 33.96, 44.31 and 31.02 insects/sample occurred on leaves fertilized by F4 respectively. On the other hand the lowest average numbers of Planthopper, *S. vibix* and *S. furcifera* were 36.08, 35.15 and 35.99, 33.96 insect/ sample occurred on leaves fertilized by F4 during the two seasons, respectively. The highest average numbers of leafhopper *E. decedens, E. decipiens* and *C. chinae* were 45.92, 50.60 and 44.32 insects/sample occurred on leaves fertilized by F1 (without potassium fertilization) in the first season respectively, but in the second season the highest average numbers 50.91, 57.44 and 44.09 insects/sample occurred on leaves fertilized by F1 respectively. On the other hand the highest average numbers of Planthopper, *S. vibix* and *S. furcifera* were 46.13, 45.94 and 45.22, 45.76 insect/ sample occurred on leaves fertilized by F1 during the two seasons, respectively .

b) Soybean plants

1) Aphid

Data Table (4) revealed that effect of potassium fertilizer on infestation degree of soybean plant with aphid *A. gossypii* was statistically highly significant in both seasons. The averages numbers of *A. gossypii* 30.64, 24.36 and 54.28, 37.35 individuals /sample occurred on leaves of soybean plants fertilized by F4 (75kg potassium fertilization / fed.) and F1 (without potassium fertilization) during the two seasons, respectively.

Table (4): Effect of different levels potassium fertilization on the infestation of soybean plants by certain piercing sucking insects along with yield during 2017 and 2018 seasons.

Fertilization	Aphid		Leafhopper						whitefly		Mean yield kg/plot	
	Aphis gossypii		*E. decedens*		*E. decipiens*		*C. chinae*		Adult stage			
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
F1	54.28[a]	37.35[a]	19.92[a]	14.58[a]	16.42[a]	13.42[a]	9.94[a]	8.58[a]	69.71[a]	81.35[a]	10.65[d]	14.14[d]
F2	46.28[b]	33.69[b]	15.11[b]	12.22[b]	14.53[b]	12.28[b]	8.91[b]	7.75[b]	63.13[b]	74.75[b]	12.54[c]	17.25[c]
F3	39.89[c]	28.92[c]	11.44[c]	9.82[c]	11.31[c]	9.50[c]	7.36[c]	6.58[c]	54.51[c]	67.19[c]	18.74[b]	19.11[b]
F4	30.64[d]	24.36[d]	8.61[d]	7.44[d]	8.53[d]	7.55[d]	6.15[d]	5.88[d]	47.79[d]	56.64[d]	21.35[a]	24.21[a]
P.	**	**	**	**	**	**	**	**	**	**	**	**
LSD 0.05	0.61	2.96	0.47	0.45	0.38	0.31	0.38	0.36	0.49	0.47	1.315	1.708

F1 = Control (without potassium fertilization) **F2= 25 kg of potassium fertilization/fed.**

F3 = 50 kg of potassium fertilization / fed. **F4 = 75 kg of potassium fertilization/fed.**

P. = probability

2) Leafhopper:

Data Table (4) indicated that the effect of potassium fertilizer on the infestation degree of soybean plants with three leafhopper *E. decedens, E. decipiens* and *C. chinae* were statistically highly significant in both seasons. The lowest average numbers of three leafhopper were 8.61, 8.53, 6.15 in the first season respectively, but in the second season 7.44, 7.55, 5.88 insects/sample, respectively occurred on fertilized by F4 (75kg potassium fertilization / fed.), respectively. While the highest average numbers of three leafhopper were 19.92, 16.42, 9.94 and 14.58, 13.42, 8.58 insects/sample occurred on fertilized by F1 (without potassium fertilization) for the two seasons, respectively.

3) Whitefly

Data in Table (4) cleared the effect of potassium fertilization on the infestation degree of soybean was statistically highly significantly in both seasons. The averages numbers of *B. tabaci* 47.79, 56.64 and 69.71, 81.35 individuals /sample occurred on leaves of soybean plants fertilized by F4 (75kg potassium fertilization / fed.) and F1 (without potassium fertilization) during the two seasons, respectively. The present results revealed that soybean plants were infested with *A. gossypii, E. decedens, E. decipiens* and *B. tabaci* these pests were recorded on soybean plants the effect of potassium fertilization on the infestation by Akbar *et al.,* (2000) Rassoulian *et al.,* (2005) ; Rutledge and Neil (2006) and Al - Habashy, Aml *et al.,* (2011). The high rates of potassium reduced the population density of these pests on cereal, legumes, soybean and maize plants Baghour *et al.,* 2001; Hashem (2005); El- Gindy (2006); Youssef (2006); El – Gindy *et al.,* (2009) and Gulluoglu *et al.,* (2010).

Mean yield (Kg/plot).

As clearly shown from the results in Table (3), the yield of maize plants treated with the different tested treatments was highly significant as flounced by fertilization treatments. The highest yield of (51.17 and 60.13) Kg/plot was recorded with F4 (75 kg potassium fertilization /fed.) whereas, the lowest yield of (18.12 and 21.32) Kg/plot was recorded with F1 (control) in the two seasons, respectively.

The same phenomenon took place with soybean plants Table (4) data show that mean yield in both seasons increased with increasing the rat of the used fertilization the highest yield of (21.35 and 24.21) Kg/plot was recorded with F4 whereas, the lowest yield of (10.65 and 14.14) Kg/plot was recorded with F1(control).

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تأثير نظم التحميل و معدل التسميد البوتاسى لمحصولى الذرة مع فول الصويا على بعض الحشرات الثاقبة الماصه

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الملخص العربى

اجريت الدراسة فى منطقة ديرب نجم محافظة الشرقية موسمى ٢٠١٦/٢٠١٧ و٢٠١٧/ ٢٠١٨ لتقييم تأثير التحميل و معدل التسميد البوتاسى على الكثافة العددية لبعض الحشرات الثاقبة الماصة للعصارة و اظهرت النتائج ان نظام التحميل الذرة مع فول الصويا ٣:٣ يقلل تعداد انواع المن *Rhopalosiphum maidis* و*Rhopalosiphum padi* و*Aphis gossypii* وكذلك الذبابة البيضاء*Bemisia tabaci* و نطاطات الاوراق *Empoasca decedens, Empoasca decipiens , Cicadulina chinae* بينما تزداد تعداد نطاطات النباتات *Sogatella vibix*, *Sogatell furcifera*. و اظهرت النتائج زيادة المحصول فى نظام التحميل ٣:٣ فى كلا الموسمين . وأوضحت النتائج ان معدل التسميد ٧٥ كجم سلفات بوتاسيوم للفدان اعطى زيادة فى محصولى الذرة و فول الصويا و اقل تعداد لبعض الحشرات الثاقبة الماصة فى موسمى الدراسة.

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