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Pesticdal action of three natural additives as organic farming procedures on infestation with the two-spotted spider mites and onion thrips on strawberry and tomato plantations under field conditions

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ABSTRACT

In this study, the effect of three natural additives (biofertilizers) used in organic agriculture on two vegetables, strawberry and tomato on the population of two main sucking pests (the two spotted-spider mite, *Tetranychus urticae* Koch; and onion thrips, *Thrips tabaci* Lind. was studied under field conditions at Tahrir Province during two successive years; 2008 and 2009 growing seasons.

The obtained data proved that, in general, the infestation with the two spotted spider mites was higher in strawberry plants than on tomato plants in both two successive years; while the vice versa was true with onion thrips where the infestation was higher on tomato plants than on strawberry plants. There was significant difference between the treatments with Compost Tea, Humic acid treatments and Super biofert & control (without treatment) in the infestation with the two-spotted spider mites on strawberry plants in both seasons. While, there was significant difference between the treatments with Compost Tea, Super biofert treatments, and Humic acid and control in case of onion thrips in the same plants. The same trend was true with the infestation on tomato plants with the two pests. Compost Tea came the first as regards to its action on some sucking pests.

INTRODUCTION

Nowadays, the use of synthetic products in veterinary pest management is becoming increasingly problematic. Issues including pest resistance, product withdrawal, undesirable environmental persistence, and high mammalian toxicity associated with synthetic pesticides, are driving research to identify new pest management approaches (Conway and Pretty, 1991). In the same time, because plants are a source of nutritients to herbivorous insects, an increase in the nutrient content of the plant may be argues to increase its acceptability as a food source to pest population, and variations in herbivore response may be explained by differences in the feeding behaviour of the herbivores themselves (Pimental and Warneke, 1989). Also, much of our knowledge about the relationship between crop nutrition and pest incidence comes from studies comparing the effects of organic agricultural practices and modern conventional methods on specific pest population. Soil fertility practices can impact the physiological susceptibility of crop plants to insect pests by either affecting the resistance of individual plant to attack or by altering plant acceptability to certain herbivores (Altieri and Nicholls, Clara (1990).

On the other hand, because of the polluting side effects of pesticides and consumers' dissatisfaction them, the organic agriculture industry is

growing. The general principle of organic agriculture is a process which develops a viable and sustainable agro-ecosystem. Sufficient quantities of biodegradable material of microbial, plant and animal origin should be returned to the soil to increase or at least maintain its fertility and the biological activity within it.

Since some of foliar fertlizers contained a toxic group such as boron, cadmium, cobalt, ... etc. (Gleason *et al*., 1969), also for its contents of inorganic salts that proved pesticidal activity against certain insects and phytophagous [Nowosielski *et al.* (1988), El-Sisi and Farrag (1989), Narkiewez *et al.* (1989), Reuveni and Reuveni (1995), Nakhla and El-Sisi (1995), Mousa and El-Sisi (2000), Abdel-Wahab and El-Sisi (2001) and Ebaid & Mansour (2006)]; therefore limited information is available on the relative toxicity of some organic additives to mites and insect pests and their natural enemies.

Organic farming practices, have become ideal substitutes for environment-friendly agriculture; apparently promote an increase of soil organic matter and microbial activity and a gradual release of plant nutrients which does not lead to enhanced N levels in plant tissues, thus in theory, allowing plants to derive a more balanced nutrition [Schuphan (1974); Yardim and Edwards (2002), Arancon *et al.* (2005) and Salman *et al.* (2007)].

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. The following are a few of the most important benefits of organic agriculture : suppress plant diseases and pests, reduce or eliminate the need for chemical fertilizers, promote higher yields of agricultural crops, facilitate reforestation, wetlands restoration, and habitat revitalization efforts by amending contaminated, compacted, and marginal soils, cost-effectively remediate soils contaminated by hazardous waste, remove solids, oil, grease, and heavy metals from storm water runoff, capture and destroy 99.6 percent of industrial volatile organic chemicals in contaminated air, and provide cost savings of at least 50 percent over conventional soil, water, and air pollution remediation technologies, where applicable (Luna, 1988, Phelan *et al*., 1995 and Mansour & Ebaid, 2006).

Strawberry and tomato plants are considered as important and popular vegetable crops in both open fields or protected plantation, to cover needs for local consumption and for exporting to the foreign markets. Both plants are subjected during their vegetative growth to infestation by many pests mainly the two-spotted spider mites, whitefly, thrips and other pests, in both the open fields and under protected conditions during their growing season, which threaten both quality and quantity of the resultant yield.

The aim of the present research is to study the miticidal and insecticidal action of some biofertilizers used in organic agriculture (Compost Tea, Humic acid and Super biofert) on the population of two main sucking pests (the two spotted-spider mite, *Tetranychus urticae* Koch; and onion thrips, *Thrips tabaci* Lind.) on strawberry [*Fragaria x ananassa* (Duch)] and tomatoes (*Lycopersicon esculentum* Mill.) plants under field conditions at

Tahrir Province during two successive years; 2008 and 2009 growing seasons.

MATERIALS AND METHODS

Two experiments were carried out at South Tahrir Province, during 2008 and 2009 growing seasons, to study the pesticidal action of treatments with three bio-materials [Compost-T, Humic acid and Super-biofert (compost alone)] on the population of two pests (the two spotted-spider mites and the onion thrips) on strawberry and tomato plants during their growing season under normal field conditions.

In each season, two areas of about two feddan, one feddan was cultivated with strawberry and the other was cultivated with tomato plants, each area was divided to four parts, each of one-fourth of feddan (1000 m² approx.), and each part treated with one of the three tested compounds at the rate of 1 litre/feddan water and the fourth one was left without treatment as control. Three applications was carried out with the three compounds, the first was after two weeks from transplanting the nurseries, the second was done after three weeks from the first application and the third was after three weeks from the second one.

The tested compounds :

1. **Super biofert :** Ready made (S 0.13 %, N 0.42 %, 0.27 %, Ca 0.21 %, Fe 0.01 %, Mg 0.10 %, B 1.10 mg/L, Cu 1.15 mg/L, Mn 3.30 mg/L, P 6.60 mg/L & Zn 3.70 mg/L and total amino acid 5.89 %)
2. **Humic acid (**Fe 3.2 %, Zn 1.84 %, Mn 0.95 %, Humic acid 72.0 %, Folvic acid 27.8 %, total nitrogen 4.0 %, pH 7.26)
3. **Compost Tea** (locally made from animal farm residues) and left in brewing cycle for 70 days before use, consisted of (Ammoniun nitrogen 47 ppm, nitrate nitrogen 36 ppm, total nitrogen 1.02 %, organic matter 25.5 %, organic carbon 14.8 %, ash 74.5 %, C : N ratio 1 : 14.5, total phosphorus 0.72 %, total potassium 0.54, and pH 6.92)

Weekly samples of 10 leaflets from both strawberry and tomato plants was collected after one week from the first application and continued for two months. Ten square inches/treatment were examined and no. of mites moving stages and thrips nymphs/10 sq.^{2} inches was recorded for each treatments and from control one, and sampling continued for 8 samples. Data subjected to M.Stat."C" statistical analysis to determine the difference between the tested treatments in the two successive seasons.

RESULTS AND DISCUSSION

Data given in Table (1) presented the effect of treatments with the three tested compounds (Compost Tea, Humic acid and Super biofert) on the average mean number of the two spotted spider mites moving stages on strawberry plants during 2008 and 2009 growing seasons under field conditions. Data indicate that, Compost Tea treatment had the lowest numbers of mites moving stages with average mean number of 54.65 mites moving stages/10 sq^2, followed by Humic acid treatment with average mean

number of 61.87 ind./10 sq^2 and both treatments followed significantly by Super biofert and control treatments with average mean number of 90.80 and 118.35 individuals/10 sq^2, respectively, during 2008 season; while at 2009 season the respective average mean numbers were 61.08, 84.10, 99.85 and 103.30 moving stages/10 sq^2, for the four previous treatments, respectively.

Table (1): Effect of treatment with three organic materials on the two spotted spider mites infestation on strawberry plantations during 2008 and 2009 seasons, at Tahrir province.

Inspection No. (weeks)	Av. mean no. of mites moving stages/10 square inches				Mean
	Compost Tea	Humic acid	Super biofert	Control	
2008 season					
1st	40.0	26.5	14.5	71.5	38.13
2nd	53.5	38.2	31.5	89.8	53.25
3rd	62.8	64.4	126.8	122.8	94.20
4th	74.5	41.4	138.6	149.5	101.10
5th	83.8	112.5	164.8	183.8	136.23
6th	57.4	67.5	143.5	150.2	104.65
7th	30.6	60.8	68.4	120.6	70.10
8th	34.6	52.9	38.3	58.6	46.10
Total	437.2	494.2	726.4	946.8	
Mean	54.65	61.78	90.80	118.35	
L.S.D.0.05	19.55				
2009 season					
1st	15.8	51.8	28.6	20.2	29.10
2nd	43.8	72.4	94.6	28.8	59.90
3rd	54.2	88.4	99.5	102.2	61.75
4th	80.5	91.5	120.6	171.5	116.03
5th	109.8	134.6	158.8	189.8	148.25
6th	81.2	84.5	111.4	174.6	112.93
7th	64.5	80.6	98.8	100.5	86.10
8th	38.8	69.0	86.5	38.8	58.25
Total	488.6	672.8	798.8	826.4	
Mean	61.08	84.10	99.85	103.30	
L.S.D.0.05	7.48				

Data given in Table (2) presented the effect of the previous three biofertilizers on the average mean number of onion thrips in strawberry plants during the two successive seasons. Data indicate that, Compost Tea also had the lowest mean numbers followed by Super biofert and the two treatments significantly differed from the Humic acid and control treatments with average mean number of 19.82, 34.77, 22.10 and 41.60 nymphs/10 sq^2 for Compost Tea, Humic acid, Super biofert and control treatments, respectively, during 2008 growing season; while the respective mean numbers was 15.15, 23.35, 23.08 and 27.78 nymphs/10 sq^2, for the previous four treatments, during 2009 strawberry growing season.

Table (2): Effect of treatment with three organic materials on the onion thrips, *Thrips tabaci* Lind. infestation on strawberry plantations during 2008 and 2009 seasons, at Tahrir province.

Inspection No. (weeks)	Av. mean no. of thrips nymphs/10 square inches				Mean
	Compost Tea	Humic acid	Super biofert	Control	
2008 season					
1st	9.8	10.5	10.6	31.6	15.63
2nd	10.4	39.5	24.6	33.8	27.08
3rd	37.6	69.8	36.8	88.5	58.18
4th	29.7	43.6	32.6	53.6	39.88
5th	25.8	42.8	28.4	41.2	34.55
6th	20.2	39.5	22.8	32.5	28.75
7th	18.6	21.5	11.8	28.0	19.98
8th	6.5	11.0	9.2	23.6	12.58
Total	158.6	278.2	176.8	332.8	
Mean	19.82	34.77	22.10	41.60	
L.S.D.0.05	6.78				
2009 season					
1st	1.5	14.4	12.0	14.5	10.60
2nd	14.0	20.5	18.6	25.5	19.65
3rd	27.8	41.0	38.8	61.2	42.20
4th	21.4	30.5	31.6	36.4	29.98
5th	20.6	28.8	30.5	28.6	27.13
6th	13.8	18.6	20.5	20.6	18.38
7th	11.6	18.4	20.4	18.8	17.30
8th	10.5	14.6	12.2	16.6	13.48
Total	121.2	186.8	184.6	222.2	
Mean	15.15	23.35	23.08	27.78	
L.S.D.0.05	4.37				

Data given in Tables (3 & 4) presented the effect of treatments with the three tested compounds (Compost Tea, Humic acid and Super biofert) on the average mean number of the two spotted spider mites moving stages and nymphs of the onion thrips on tomato plants during 2008 and 2009 growing seasons under field conditions. Data indicate that, generally, the tomato plants are liable to infestation with thrips than mites during the two successive seasons. Compost Tea treatment had the lowest numbers of mites moving stages with average mean number of 10.52 mites moving stages/10 sq^2, followed significantly by Humic acid treatment with average mean number of 21.82 individuals/10 sq^2, followed significantly by Super biofert and control treatments with average mean number of 32.52 and 38.35 individuals/10 sq^2, respectively, during 2008 season; while at 2009 season the respective average mean numbers were 16.80, 22.32, 24.02 and 3.05 moving stages/10 sq, for the four previous treatments, respectively.

Data given in Table (4) presented the effect of the same three biofertilizers on the average mean number of the onion thrips in tomato plants during 2008 and 2009 tomato growing seasons. Data indicate that, Compost Tea also had the lowest average mean numbers (49.08 ind./10 sq^2), followed by Super biofert (80.10 ind./10 sq^2) and the two treatments significantly differed from the Humic acid (119.95 ind./10 sq^2) and control treatment (130.75 ind./10 sq^2), during 2008 growing season; while the respective average mean numbers was 34.54, 55.90, 49.72 and 63.29 nymphs/10 sq^2,

for the same previous four treatments, during 2009 tomato growing season under normal field condition.

Table (3): Effect of treatment with three organic materials on the two spotted spider mites infestation on tomato plantations during 2008 and 2009 seasons, at Tahrir province.

Inspection No. (weeks)	Av. mean no. of mites moving stages/10 square inches				Mean
	Compost Tea	Humic acid	Super biofert	Control	
2008 season					
1st	1.0	11.0	18.2	20.6	12.70
2nd	6.4	13.2	18.6	24.2	15.60
3rd	8.6	18.5	36.0	24.8	21.98
4th	14.8	24.5	38.5	42.8	30.15
5th	20.2	33.6	56.4	60.6	42.70
6th	18.6	30.2	30.5	54.0	33.33
7th	11.0	29.8	30.5	48.8	30.03
8th	3.6	13.8	31.5	31.0	19.98
Total	84.2	174.6	260.2	306.8	
Mean	10.52	21.82	32.52	38.35	
L.S.D.0.05	4.80				
2009 season					
1st	6.0	12.0	8.0	10.0	9.00
2nd	6.8	12.5	18.4	18.4	14.03
3rd	12.2	18.5	16.5	21.6	17.20
4th	18.6	24.6	21.0	27.5	22.93
5th	40.8	38.4	47.5	52.8	44.88
6th	24.0	32.8	38.6	42.5	34.48
7th	20.2	27.6	24.2	38.6	27.65
8th	5.8	12.2	18.0	24.4	15.10
Total	134.4	178.6	192.2	235.8	
Mean	16.80	22.32	24.02	29.48	
L.S.D.0.05	3.05				

The above-mentioned results are in accordance with several researches on the effect of organic fertilization on some pests on certain plants all over the world which reveal the pesticidal action of compost and other natural derivatives affect the abundance of arthropod pests. Schuphan (1974) in a long-term comparative study of organic and synthetic fertilizer effects on the nutritional content of four vegetables reported that the organic grown (OG) vegetables consistently contained lower levels of nitrate and higher levels of potassium, phosphorus and iron than chemical grown (CG) vegetables, and suggest that the lower foliar content of NO3-N of OG crops may be a key factor in determining lower insect damage on crops fertilized with organic amendments. Abou-Awad (1984) reported that applications of manganese sulfate at 20 or 30 ppm in the presence of ammonium sulfate could reduce populations of *T. arabicus* and increase yield, and applications without ammonium sulfate resulted in higher numbers of mites and a lower yield than was observed on untreated plots or on plots received only 10 ppm manganese sulfate. Kieliewicz and van de Vrie (1990) evaluated some chrysanthemum leaf characteristics to determine their importance as nutrition

for, and as factors of resistance to *Tetranychus urticae* Koch. Mite density was lower on young leaves than on mature ones. Young leaves appear to be protected against *T. urticae* by a higher concentration of mono-and polyphenols, although they contained higher levels of nutrients than mature ones. Harris *et al.* (1998) reported that spider mite infestation level was significantly lower in potassium treatments in some varieties while little or no effect was seen in other varieties. And potassium fertility effect on spider mites did not appear to be related to the maturity characteristic of the cotton varieties. Huelsman *et al.* (2000) proved that there was a negative correlation between manganese levels in the soil and the total sucking pest populations affecting sweet potato in Jamaica. Yardim and Edwards (2002) evaluated the effects of organic (composted cow manure) and synthetic (NPK) fertilizers on pests (aphids and flea beetles) and predatory arthropods (anthocorids, coccinellids and chrysopids) associated with tomatoes. They suggested that there were lower populations of aphids on tomatoes grown with the organic fertilizer than on those grown with the synthetic fertilizers, indicating that organic fertilizers may have the potential to reduce pest attacks in the long term.

Table (4): Effect of treatment with three organic materials on the onion thrips, *Thrips tabaci* Lind. infestation on tomato plantations during 2008 and 2009 seasons, at Tahrir province.

Inspection No. (weeks)	Av. mean no. of thrips nymphs/10 square inches				Mean
	Compost Tea	Humic acid	Super biofert	Control	
2008 season					
1st	37.5	83.1	65.6	73.7	64.98
2nd	66.8	120.5	78.5	120.4	96.55
3rd	56.4	143.8	111.6	172.5	121.08
4th	83.6	196.8	131.8	230.6	160.70
5th	48.8	118.6	90.8	170.8	107.25
6th	44.5	112.4	80.4	134.6	92.98
7th	38.2	93.6	58.5	88.8	69.78
8th	16.2	90.8	23.6	54.6	46.30
Total	392.6	959.6	640.8	1046.0	
Mean	49.08	119.95	80.10	130.75	
L.S.D.0.05	19.15				
2009 season					
1st	4.8	18.4	12.1	16.8	13.03
2nd	32.6	54.5	57.5	46.5	47.78
3rd	42.5	82.4	88.6	89.8	75.83
4th	64.8	121.6	100.8	121.8	124.75
5th	48.6	86.5	73.5	88.6	74.30
6th	40.8	60.5	40.8	72.5	53.65
7th	27.5	16.8	12.6	45.7	25.65
8th	14.7	6.5	11.9	24.6	14.43
Total	276.3	447.2	397.8	506.3	
Mean	34.54	55.90	49.72	63.29	
L.S.D.0.05	4.65				

Anthocorid populations were larger on tomato plants with high aphid populations in the synthetic than in the organic fertilizers-treated plots. Parvez

et al. (2003) studied the effect of organic and synthetic fertilizers on the infestation of sucking insect pests viz, Whitefly (*Bemisia tabaci*) Jassid (*Amrasca davastans*) Thrips (*Thrips tabaci*) and percent damage by spotted bollworms (*Earias spp.*) and American bollworms (*Helicoverpa armigera*) on six cotton varieties and revealed that the crop grown in organic fertilizer harbour lesser number of insect pests. Arancon *et al.* (2005) studied the effects of commercial vermicomposts, produced from food waste, on infestations and damage by aphids, mealy bugs and cabbage white caterpillars in the greenhouse. Results revealed that substitution of vermicomposts suppressed populations of both aphids and mealy bugs on peppers, and mealy bugs on tomatoes, significantly. Also, solid vermicomposts can suppress spider mite, mealy bug and aphid populations in the field . Bell *et al.* (2008) reported that Compost may support invertebrate detritivores which maintain predators until aphids arrive; on the flipside, composting might be detrimental to pest control by providing alternative prey. To help elucidate this, compost addition experiments were conducted in central England.

REFERENCES

Abdel-Wahab, E.S. and El-Sisi, A.G. (2001). Mineral salts as an alternatives of conventional pesticides for controlling cotton leafworm. J. Agric. Sci., Mansoura Univ., 26 (1) : 435-438.

Abou-Awad, B.A. (1984). Effect of nitrogen and manganese fertilization on the tetranychid mite, *Tetranychus arabicus* Attiah, and resulting effect on yield of cotton plants. Bull. Soc. Ent. Egypte, 63 : 95-98.

Altieri, M.A. and Nicholls, Clara I. (1990). Biodiversity, ecosystem function and insect pest management in agricultural systems. In Collins, W.; Qualset, C.O. (Eds.), Biodiversity in Agro-ecosystems. CRC Press, Boca Raton, 69-84.

Arancon, N.Q.; Paola, A.G. and Edwards, C.A. (2005). Suppression of insect pest populations and damage to plants by vermicomposts. Bioresource Tech., 95 (10) : 1137-1142.

Bell J.R., Traugott M., Sunderland K.D., Skirvin D.J., Mead A., Kravar-Garde L., Reynolds K., Fenlon J.S. & Symondson W.O.C. (2008) Beneficial links for the control of aphids: the effects of compost applications on predators and prey. J. Appl. Ecol., 45:1266-1273.

Conway, G.R. and Pretty, J. (1991). Unwelcome Harvest. Agriculture and Pollution, Earthscan, London.

Ebid, G.H. and Mansour, E.S. (2006). Relative population abundances of sap-sucking pests and associated predators in relation to non-chemical treatments in cotton fields in Egypt. Egypt. J. Biol. Pest Control, 16 (1 & 2) : 11-16.

El-Sisi, A.G. and Farrag, R.M. (1989). Formulation and biological effects of copper carbonate against the Egyptian cotton leafworm, *Spodoptera littoralis*. Agric. Res. Rev., 67 (1) : 29-35.

Gleason , M.N.; Gosselin, H.C. and Smith, R.P. (1969). Clinical toxicology of commercial products. Acute poisoning. 3rd ed. The William and Co., Baltimore Library of Congress. Catalog Card No. 68-22712, U.S.A.

Harris, F.A.; Tupper, G.R. and Furr, R.E.Jr. (1998). Potassium fertilizer effect on twospotted spider mite. Proc. Of the Beltwide Cotton Conference, II : 982-983.

Huelsman, M.F.; Edwards, C.A.; Lawrence, J. and Clarke-Harris, D.O. (2000). A study of the effect of soil nutrient levels on the incidence of insect pests and predators in Jamaican sweet potato (*Ipomoea batatas*) and callaloo (*Amaranthus*). The PCPC Conf., Pests and Diseases, Brighton, UK, 895-900.

Kieliewicz, M. and M. van de Vrie (1990). Within leaf differences in nutritive value and defence mechanism in chrysanthemum to the two-spotted spider mites (*Tetranychus urticae*). Exp. and App. Acarology, 10 (1) : 33-43.

Luna, J.M. (1988). Influence of soil fertility practices on agricultural pests. In : Proc. 6th Int. Sci. Conf. of IFOAM on Global Perspectives on Agroecology and Sustainable Agricultural Systems. Santa Cruz, CA, 589-600.

Mansour, E.S. and Ebaid, G.H. (2006). Joint action of plant growth promoter and microelements on cotton plants nutrition and on infestation rates with bollworms. J. Agric. Sci., Manoura Univ., 31 (3) : 1621-1631.

Mousa, Gehad M. and El-Sisi, A.G. (2000). Pesticidal efficiency of some inorganic salts against sucking pests infesting *Phaseolus vulgaris* (L.) seedlings. Egypt. J. Agric. Res.

Nakhla, J.M. and El-Sisi, A.G. (1995). Evaluation of some inorganic salts against the small garden snail, *Theba pisana* (Mulle). Egypt. J. Agric. Res., 73 (2) : 365-379.

Narkiewcz, J.J.; Tmoczak, J. and Nowosieiski, O. (1989). Plant protecting foliar fertilizers in pest control on vegetables. Biuletyn-Waczywniczy, 1 : 75-82.

Nowosielski, O.; Dziennik, W.; Kohinska, T.; Nar Kiewicz, J. and Dobranska, J. (1988). A biological basis for the efficiency of plant protecting foliar fertilizers in vegetable production. Acta Hort., 222 : 105-116.

Parvez, E.; Shadid, H.; Abdul Rashid and Nisar, S. (2003). Comparative effect of organic and synthetic fertilizers on the infestation of sucking and bollworms insect pest complex on different varieties of cotton (*Gossypium hirsutum* L.). Asian J. of Plant Sci., 2 : 1135-1137.

Phelan, P.L.; Mason, J.F. and Stinner, B.R. (1995). Soil fertility management and host preference by European corn borer, *Ostrinia nubilalis* on *Zea mays*; a comparison of organic and conventional chemical farming. Agric. Ecosyst. Environ., 56 : 1-8.

Pimental, D. and Warneke, A. (1989). Ecological effects of manure, sewage sludge and other organic wastes on arthropod populations. Agric. Zool. Rev., 3 : 1-30.

Reuveni, M. and Reuveni, R. (1995). Efficacy of foliar sprays of phosphates in controlling powdery-mildews in field-grown nectarine, mango trees and grapevines. Crop Protection, 14 (4) : 311-314.

Salman, A.M.A.; Abdel-Moniem, A.S.H. and Obidalla-Ali, H.A. (2007). Influence of certain agricultural practices on the cowpea aphid, *Aphis craccivora* Koch, infesting broad bean crops and the relation between the infestation and yield of plants in Upper Egypt. Archives of Phytopathology and Plant Protection, 40 (6) : 395-405.

Schuphan (1974). Nutritional value of crops as influenced by organic and inorganic fertilizer treatments. Quel. Plant Foods. Husn. Nutr., 23 : 333-358.

Yardim, E.N. and Edwards, C.A. (2003). Effect of organic and synthetic fertilizer sources on pest and predatory insects associated with tomatoes. Phytoparasitica, 31 (4) : 324-329.

الفعل الإبادى لثلاثة من الإضافات الطبيعية والتى تستخدم فى الزراعات العضوية على الإصابة بالعنكبوت الأحمر العادى وتربس البصل فى زراعات الفراولة والطماطم تحت ظروف الحقل

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نتج عن الإستخدام الكثيف وغير الواعى للمبيدات والأسمدة الكيماوية بعد الحرب العالمية الثانية بغرض زيادة إنتاجية الأراضى الزراعية لتتلاءم والزيادة المتوقعة فى عدد سكان الكرة الأرضية لظهور العديد من المشاكل البيئية والصحية الكبيرة والتى دعت الحاجة معها للعودة لإستخدام البدائل الطبيعية وظهور ماعرف بالزراعة العضوية التى لايتم فيها إستخدام المبيدات الكيماوية بأنواعها (حشرية وفطرية ونيماتودية وقواقع وقوارض .... الخ) وكذلك الأسمدة الكيماوية ..

تم فى هذا البحث، دراسة تأثير المعاملة بثلاث من المركبات العضوية التى تستخدم فى الزراعة العضوية كبديل عن إستخدام الأسمدة الكيماوية وذلك لتحسين وزيادة الإنتاجية وللحصول على منتجات عضوية على مستوى الإصابة بافتين رئيسيتين تصيبان زراعات محصولين من الخضر فى مصر وهما الفراولة والطماطم خلال موسم نموهما وهما العنكبوت الأحمر العادى وتربس البصل وذلك فى قطاع جنوب التحرير خلال موسمى 2008 و 2009. حيث أستخدمت مركبات (شاى عضوى، هيوميك آسيد، سوبر بيوفرت) حيث تمت المعاملة بهذه المركبات الثلاثة ثلاث مرات بعد شهر من الزراعة ثم معاملة ثانية بعد ثلاثة أسابيع ثم معاملة ثالثة وأخيرة بعد ثلاثة أسابيع أخرى وذلك بمعدل واحد لتر/فدان. تم فحص عينات أسبوعية من النباتات (العينة عبارة عن عشرة وريقات من نباتات كل معاملة حيث تم فحص بوصة مربعة من كل وريقة وتم عدً الأطوار المتحركة للعنكبوت الأحمر العادى وكذلك حوريات التربس) وذلك بعد المعاملة الأولى بالمركبات الثلاثة وكذلك معاملة المقارنة (بدون معاملة) ولثمانية عينات.

أظهرت النتائج أنه بصفة عامة كانت الإصابة بالعنكبوت الأحمر أعلى على نباتات الفراولة عنها عن نباتات الطماطم بعكس الإصابة بتربس البصل حيث كانت الإصابة على الطماطم أعلى منها عن الإصابة فى الفراولة. وبالنسبة لتأثير المعاملة بالمركبات الثلاثة على تعداد الآفتين فقد أظهرت المعاملات أنه بالنسبة لمحصول الفراولة وجد فرق معنوى بين معاملتى الشاى العضوى والهيوميك آسيد وكلا من معاملتى سوبر بيوفرت والمقارنة (بدون معاملة) وكانت أفضل المعاملات هى معاملة الشاى العضوى تلتها المعاملة بالهيوميك آسيد .. أما بالنسبة للتربس فقد وجد فارق معنوى بين معاملة المقارنة وباقى المعاملات وكان ترتيب المعاملات من حيث أفضليتها الشاى العضوى ثم سوبر بيوفرت وأخيرا معاملة الهيوميك آسيد. وقد حققت نفس المركبات نفس التأثير على كلتا الآفتين على محصول الطماطم حيث تفوقت المعاملة بالشاى العضوى على باقى المعاملات وبفارق معنوى عن باقى المعاملات وعن معاملة المقارنة. مما يوصى معه بإستخدام مثل هذه المركبات فى الزراعات العضوية لأمانها البيئى من جهة وفعلها الإبادى الواضح على مثل هذه الآفات الثاقبة الماصة.

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