

**CONTROL OF THRIPS TABACI (LINDMAN)
(HOMOPTERA: THIRIPIDAE) UNDER FIVE
DIFFERENT LEVELS OF FERTILIZER ON
GLADIOLUS SP.(IRIDACEAE)**

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ABSTRACT

The present investigation was carried out at the ornamental flower farm in Abu Galeb village, Giza governorate throughout two successive seasons (2013 and 2014).The experiment studied the effect of four different pesticides (Ashok, Bovaria, Mlathion and Actara) under five different fertilizer levels on the population density of the onion thrips *Thrips tabaci* (lind.) infested *Gladiolus* sp.(Iridaceae). Obtained results during two seasons indicated that, the most efficient control agents after general mean of 14 days of spraying was Ashok for non fertilizer (0,0,0) the reduction percentages was 78% of *T. tabaci* on 2013 season and 71 % on 2014 season, respectively. on the other hand, the least potent was Mlathion for non fertilizer (0,0,0) the reduction percentages was 48% of *T.tabaci* on 2013 season and 42 % on 2014 season, respectively. After general mean of 14 days of spraying.

INTRODUCTION

Gladiolus is a spike-type flower that is gaining popularity with small scale growers for both local and export markets, *gladiolus* is popular to consumers and florist because it has many spike forms, colours and cooler combinations, an advantage in every floral arrangement *gladiolus* has been an all time favourite for long in the cut-flower industry and one of its' big advantage is its' ability to tolerate heat as long as air humidity and soil moisture are at an optimum. Anon (2003).The *gladiolus*, *Gladiolus grandiflorus* are a complex of at least 11 species and are grown from corms propagated from cormels (daughter corms), and grown throughout Africa and Mediterranean regions with the greatest concentration in South Africa. Laurence (2010).

Soil fertility management may also affect thrips infestation and damage. According to one source, a lack of adequate soil calcium may invite higher populations of thrips. Another writer suggests that nutritional balance can reduce thrips attack. High nitrate levels will invite thrips, and the effects of excessive nitrate are compounded by shortages of potassium, sulfur, boron, and manganese. Foliar applications of soluble calcium and kelp will balance the excess nitrogen. These nutrient levels can be monitored on a weekly basis, using plant tissue analysis, to make accurate adjustments. Mahr et al. (2001).

Soils with high organic matter and active soil biology generally exhibit good soil fertility. Crops grown in such soils generally exhibit lower abundance of several insect herbivores, reductions that maybe attributed to a

lower nitrogen content in organically farmed crops. On the other hand, farming practices, such as excessive use of inorganic fertilizers, can cause nutrient imbalances and lower pest resistance. Altieri and Nicholls(2003).

Pathogen can be used to suppress thrips. Populations. Adult thrips appears to be most susceptible to fungi because they generally occur in flowers where humidity is higher and conditions more favourable for infection. The higher humidity in the flowers increases the potential for the fungus to speculate and infect additional thrips. *Beauveria bassiana* suppresses thrips as well as currently registered insecticides does . Loung(2008)

The conventional insecticides sumithion and non conventional insecticides svefes and biofly exhibited a high efficiency against the onion thrips *T. tabaci* population with highest reduction percentage . Also, the micro-element Born was the highest percentage of reduction followed by Manganase(Awadalla et al2011).

All three insecticides (Acephate, Bifenthrin, and Spinosad) were effective in keeping the thrips infestation below a predetermined level, five thrips per plant, but Bifenthrin required the most number of applications to do so. For chrysanthemum, a fast-growing crop and heavy utilize of fertilizer, fertilization influenced not only the population growth of pest insects but also plant production time. Chau et al.(2005).

MATERIALS AND METHODS

The present study was carried in ornamental farm in Abu Galb village at Giza Government, Egypt; to study the insects infected certain cut flowering plants in tow successive years 2013 and 2014. The soil was moderately well drained with sandy loam texture in all experiments. Experimental area was 240m²; the experimental area was divided into five equal plots, according to fertilization trials. The field was properly prepared, weeds and stubbles were cleared, ploughed, harrowing, levelling, open the furrows and ridges as 50 cm per spacing Irrigation channels were made a day prior to the planting. The plugging to a depth 30cm. Application of composed (plants remains) 40kg per the planting area (240m²) after land preparing. Fertilization was ammonium nitrate (N) which contain 30-33% N₂., mono calcium super phosphate (p) which contain 15% P₂O₅, potassium sulphate (K) which contain 48% K₂O and Kristalon ,N :P: K: 20:20:20.. The experiment was laid out under randomized complete block design. Every plot was divided into 5 suplots for pesticides treatment and control. Everyone was 3 rows. According to (William and Grant 2011) for accounting units of fertilizer, the nitrogen, phosphorus and potassium treatments tried in this trail were:(T₀):control (untreated),(T₁): kristalon 20:20:20 units (63.56kg/fed.), (T₂): Kristalon plus nitrogen 25:20:20 units (63.56+6.36 kg/fed.) , (T₃):kristalon plus phosphorus 20:25:20 units (63.56+14kg/fed.). (T₄) : kristalon plus potassium 20:20:25 units (63.56+4.38kg/fed.) , All five fertilizers treatments were applied at the time of sowing as top dressings, The insecticides listed blow (table 1).Applying the insecticides was in the early morning, using the ground motor, before spraying and 3days.,7days and 14days after application of insecticides

by counting thrips population mean number of insects/ plant in 3 plants, selected randomly in each treated and un treated plot. The tested pest was the insecticides used and their common, trade and chemical name Chauha and Sharma (2004). The rates of application of investigated insecticides are shown in table (1). Target pests the infested *Gladiolus* sp., A few flowers collected periodically during the experimentation period and placed in a small container with 70% alcohol. The container can be shaken to dislodge the thrips, which can then be examined under a microscope to identify the species. The samples of onion thrips, *Thrips tabaci* (Lind.) were identified by Insect Classification Dept., Plant Protection Research Institute, Dokki, Giza, Egypt. The number of thrips in the flowers determined by picking the flower and placing it in on a white board. Gently tear open the flower so that the thrips will emerge onto the board where the adults and larvae can be readily distinguished and counted.

Table(1):Treatment procedures:

No	common name	Trade name	chemical structure	Rate/100L. water.
1	Malathion	Mlathion	Dimethoxy phosphorothiol	1.5L.
2	Ashok	Neem	Azatin(margosan-o)	750cm ³ .
3	Bovaria 50%EC	Bovaria 50%EC	Fungi of <i>B.bassiana</i> (seb8661)strain	400gm.
4	Actara	Actara	Thiamethoxam	20gm.

Statistical Analysis:

The statistical analysis was carried out by using ANOVA analysis in SAS program (2004).

The reduction percentage, (R% percentage) of population reduction was carried out by Henderson and Telton equation(1955) :

Percentage of reduction = 100 [1-(Ta X Cb / Tb X Ca)] where:-

Ta: Post-treatment count in treated plod

Tb: Pre-treatment count in treated plot

Ca: Untreated count before treatment in control plot

Cb: Untreated count after treatment in control plot

RESULTS AND DISSECTION

1-Effect of different rates of fertilizers on *T.tabaci* infesting *Gladiolus* sp.:

Field treatments of the infested gladiolus plants by *T.tabaci* revealed that the number of alive thrips increased in the 25-20-20 rate of fertilizer while it decreased with the most tested rates. The population density of *T.tabaci* at sampling sites undertaken in the field planted gladiolus during different days (0,3,7and 14 day) presented for 2013 season in (table 2),.population of thrips was different among the rate of fertilizer, highest number of thrips was found

on 25-20-20 rate of fertilizer among all sampling in season 2013. The tested rates of fertilizer could be arranged in ascending order according to general means number of alive thrips as following 25-20-20, 20-25-20, 20-20-25, 20-20-20 and 0-0-0. The corresponding values of general mean were (37.2, 29.3, 29.2, 28.7 and 24.7) respectively. For 2014 season (Table 3) The tested rates of fertilizer could be arranged in ascending order according to general means number of alive thrips as following 25-20-20, 20-20-20, 20-25-20, 20-20-20 and 0-0-0. The corresponding values of general mean were (61.8, 53.2, 51.2, 50.75 and 45.9) respectively. These results agree with Altieri and Nicholls (2003) Who found reductions in thrips population may be attributed to a lower nitrogen content in organically farmed crops.

Table(2): Evaluation of different compounds against Thrips tabaci on fertilizing Gladiolus sp. during seasons 2013

Treatment	Fertilizing rate												G. mean	residual effect
	25-20-20		20-25-20		20-20-25		20-20-20		0-0-0					
	mean	R%	mean	R%	mean	R%	mean	R%	Mean	R%				
Ashok	pre	78	--	60	--	62	--	63	--	53	--	63.2	--	
	3D.	27	55%	17	55%	18	51%	14	62%	16	60%	18.4	57%	
	7D.	16	65%	13	57%	14	64%	13	64%	12	62%	13.6	62%	
	14D.	11	71%	9	73%	10	67%	7	71%	8	68%	9	70%	
Bovaria	pre	74	--	58	--	54	--	59	--	49	--	58.8	--	
	3D.	23	59%	33	53%	16	52%	17	55%	22	40%	22.2	50%	
	7D.	12	72%	11	62%	10	72%	10	66%	16	46%	11.8	64%	
	14D.	10	72%	8	75%	9	68%	8	65%	10	57%	9	67%	
Actara	pre	73	--	60	--	58	--	61	--	45	--	59.4	--	
	3D.	36	35%	19	50%	20	42%	21	44%	20	41%	23.2	42%	
	7D.	14	67%	12	61%	15	52%	15	49%	14	49%	14	56%	
	14D.	16	55%	11	67%	13	54%	10	57%	9	58%	11.8	58%	
Mlathion	pre	75	--	58	--	63	--	60	--	52	--	61.6	--	
	3D.	36	36%	29	22%	28	25%	26	26%	23	41%	28.4	30%	
	7D.	25	44%	21	29%	24	40%	22	25%	18	42%	22	36%	
	14D.	19	51%	16	51%	15	52%	16	31%	13	48%	15.8	47%	
Control	pre	70	--	55	--	57	--	61	--	40.3	--	56.6	--	
	3D.	53	--	36	--	34	--	38	--	30	--	38.2	--	
	7D.	41	--	28	--	36	--	29.6	--	24.3	--	31.7	--	
	14D.	34	--	31	--	28	--	23	--	19	--	23.2	--	
General mean		37.2 A	--	29.3 B	--	29.2 B	--	28.7 B	--	24.7 B	--	--	--	

L.S.D.0.05 Treatment : 5.258

L.S.D.0.05 Time: 4.7029

L.S.D.0.05 Fertilizer : 5.258

Means with the same letter are not significantly different.

Table(3):Evaluation of different compounds against Thrips tabaci on fertilizing Gladiolus sp. during seasons 2014

Treatment	Fertilizing rate										G. mean	residual effect	
	25-20-20		20-25-20		20-20-25		20-20-20		0-0-0				
	mean	R%	mean	R%	mean	R%	mean	R%	mean	R%			
Ashok	pre	90	--	81	--	70	--	69	--	67	--	75.4	--
	3D.	36	61%	29	64%	27	68%	30	62%	32	58%	30.8	63%
	7D.	29	68%	21	74%	18	77%	22	72%	28	61%	23.6	69%
	14D.	14	83%	10	86%	9	87%	11	84%	16	76%	12	83%
Bovaria	pre	94	--	85	--	72	--	74	--	71	--	79.2	--
	3D.	59	36%	41	39%	51	40%	55	32%	44	43%	50	38%
	7D.	35	61%	31	62%	34	57%	32	59%	29	60%	32.2	60%
	14D.	25	71%	18	76%	15	79%	13	81%	10	85%	16.2	78%
Actara	pre	98	--	85	--	72	--	70	--	73	--	79.5	--
	3D.	52	53%	45	45%	48	43%	47	43%	41	47%	46.6	46%
	7D.	43	55%	41	51%	36	55%	40	51%	42	42%	40.4	51%
	14D.	44	51%	35	54%	34	53%	36	50%	35	55%	36.8	53%
Mlathion	pre	95	--	83	--	74	--	73	--	71	--	79.2	--
	3D.	55	40%	49	39%	52	40%	54	34%	52	33%	52.4	37%
	7D.	53	42%	46	43%	48	41%	52	38%	44	39%	48.6	39%
	14D.	47	45%	42	44%	44	40%	46	39%	39	43%	43.6	42%
Control	pre	95	--	84	--	73	--	69	--	73	--	78.8	--
	3D.	93	--	81	--	85	--	81	--	78	--	83.6	--
	7D.	92	--	82	--	80	--	79	--	73	--	81.2	--
	14D.	87	--	75	--	73	--	71	--	69%	--	61.3	--
general mean	--	61.8 A	--	53.2 B	--	50.75 B	--	51.2 B	--	45.9 B	--	--	--

L.S.D. Treatments: 5.843

L.S.D. Fertilizer: 6.235

L.S.D. Time : 5.32

Means with the same letter are not significantly different.

2-Efficacy of different compounds on T.tabaci infesting fertilizing Gladiolus sp.:

The average pre-treatment numbers of alive thrips were as shown in table (4) for 2013 and table (5) for 2014. Significant difference was obtained between the compounds and pre treatment. According to spraying time we can be noticed that ascending order of a live thrips as following, After 3,7,14 days after treatment the corresponding general means (26.08,18.82,15.56) comparing with 59.9 in 2013, and in 2014 were (52.68,45.2,33.96) comparing with 78.5 in pre treatment. All compounds gave moderate reduction percentage. The tested compound could be arranged in ascending order as Mlathion (37%), Actra (52%), Ashok (60%) and Bovaria (63%) respectively for 2013, and for 2014 were Mlathion (39%), Actra (50%), Bovaria (59%), Ashok (72%), respectively. Concerning the mean residual effects of tested compounds, it is clear that Ashok was highly effective in controlling T.tabaci in fertilizing gladiolus with (0,0,0) which has lowest general mean (24.6) in 2013, reduction percentage after 3,7,14 days were (60%,62%,68%) respectively and the lowest one was Mlathion (41%,42%,48%). In 2014, also Ashok was highly effective in controlling T.tabaci in fertilizing gladiolus with (0,0,0) which has lowest general mean (45.9.6), reduction percentage after 3,7,14 days were (63%,69%,83%) respectively and the lowest one was Mlathion (37%,39%,42%). The results are agree with those obtained by Shelton et al., (2006) who mentioned that onion thrips is able to acquire some

resistance to several insecticide families, making chemical treatments ineffective, although this depends on the biology of the pest, the season, environmental factors and number of thrips generations. The insecticides: Thiodan, Confidor, Tracer, Megamos, and Actara were sprayed three times and data were taken at 24 hours, 72 hours, seven days and 10 days intervals. Except Actara, all insecticides were significantly effective against the pest as compared to control Funderburk et al., (2011). Maximum cost-benefit ratio was recorded for Confidor (39.45) and the least was recorded for Actara (3.41) treated plots to control *T. tabaci* on onion crop.

Table(4): Mean and reduction percentage for thrips population after pesticides spray in 2013.

Treatments	Pre-treatment	3 Days		7 Days		14 Days		General mean	Residual effect
		mean	R%	mean	R%	mean	R%		
Bovaria	58.8	22.2	50%	11.8	64%	9	67%	25.45	60%
Ashok	63.2	18.4	57%	13.6	62%	9	70%	26.05	63%
Mlathion	61.6	28.4	30%	23	33%	15.8	47%	32.2	37%
Actara	59.4	23.2	42%	14	56%	11.8	58%	27.1	52%
Cntrol	56.6	38.2	--	31.7	--	32.2	--	39.6	-
G. mean	59.92	26.08	--	18.8	--	15.56	--	--	--

Table(5): Mean and reduction percentage for thrips population after pesticides spray in 2014.

Treatments	Pre-treatment	3 Days		7 Days		14 Days		General mean	Residual effect
		mean	R%	mean	R%	mean	R%		
Bovaria	79.4	50	38%	32.2	60%	16.2	78%	44.45	59%
Ashok	75.4	30.8	63%	23.6	69%	12	83%	35.45	72%
Mlathion	79.2	52.4	37%	48.6	39%	43.6	42%	55.95	39%
Actara	79.8	46.6	46%	40.4	51%	36.8	53%	50.9	50%
Cntrol	78.8	83.6	--	81.2	--	61.2	--	76.2	--
G. mean	78.52	52.68	--	45.2	--	33.96	--	--	--

Ullah, (2010). Ahmed and El-Mogy (2011), conclude that it can be use Bio power and Jojoba oil on growing period and Nimbecidine on flowering period in integrated pest management of *T. tabaci* on onion crop.

Palumbo et al., (2000) reported that, Actara and Avaunt, two new experiential insecticides did not significantly control adults and provided only marginal activity against the larvae when applied alone. Combination of these products with either Lannate or Warrior significantly enhanced control, but usually not greater than that shown from the Lannate or Warrior applied alone. Several botanical products were evaluated (Azadirachtin, Pyrethrins, crop oils and garlic). Unfortunately, none of the botanical products significantly reduced thrips numbers to economically acceptable levels of control. Similar to previous studies, our results suggest that even the most efficacious products appeared to maintain thrips.

Finally, it could be concluded that the treatment of different compounds can be arranged according to its reduction percentage to

(Ashok, Bovaria, Actara and Mlathion). All compounds gave significant control of *T. tabaci* in addition of decreasing the nitrogen fertilizer rate. Mean numbers of *T. tabaci* on gladiolus plants did not affected by increasing phosphorus and potassium rate with treated compound. Finally, it could be concluded that the treatment of different compounds (Ashok, Bovaria, Mlathion and Actara) under five different fertilizer levels gave significant control of the onion thrips, *Thrips tabaci* (Lind.) infested gladiolus plants, decrease the nitrogen rate of fertilizer reduced the average number of *T. tabaci* on gladiolus plants, increase phosphorus and potassium not effect on the number of *T. tabaci* on gladiolus with the treated compound.

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مكافحة تريبس البصل الذى يصيب نباتات الجلادولس المسمدة بمعدلات مختلفة بمحافظة الجيزة - مصر وفائى ذكى عاذر^١, حسن محمد صبجى^٢, أحمد محمد عبد الحكيم^٣ و إيناس عادل عبد اللطيف^١ أمعهد البحوث و الدراسات الأفر يقية أمعهد بحوث وقاية النبات - مركز البحوث الزراعية- الدقى - الجيزة .

أجرى هذا البحث بمزرعة خاصة بنباتات الزينة و زهور القطف بقرية أبو غالب بمحافظة الجيزة خلال عامين متتاليين ٢٠١٣-٢٠١٤ وذلك لدراسة وتقدير أثر المعاملة بخمس مركبات مختلفة لمكافحة تريبس البصل تحت تأثير معدلات سمادية مختلفة في الجلادولس وقد لوحظ أنه:

أ- لا يوجد فروق معنوية للكثافة العددية لحشرة التريبس بين كل من المستويات التسميدية التالية ممثلة بالمتوسط العام للإصابة / نبات

١- التسميد المتعادل للوحدات السمادية و المتمثل فى مستحضر (الكريستالون) السامى و الذى يحتوى على ٢٠ وحدة لكل من النيتروجين والفسفور والبوتاسيوم .

٢- التسميد المرتفع بالبوتاسيوم و الذى يحتوى على ٢٥ وحدة من البوتاسيوم و ٢٠ وحدة لكل من النيتروجين والفسفور .

٣- القطع التجريبية المعاملة بالكومبوست فقط و الغير معاملة بالتسميد المعدنى (٠,٠,٠).

بينما يوجد فروق معنوية بين التسميد المرتفع للنيتروجين (٢٥-٢٠-٢٠) و الذى يحتوى على ٢٥ وحدة من النيتروجين و ٢٠ وحدة لكل من الفسفور و البوتاسيوم من حيث كثافة تعداد الآفة حيث سجل أعلى تعداد للتريبس للمعدل (٢٥-٢٠-٢٠) و كان للعام ٢٠١٣ (٣٧.١٥) بينما كان للمعدل (٠,٠,٠) (٢٣.١٠) اما فى العام ٢٠١٤ فكان (٦١.٨) للمعدل (٢٥-٢٠-٢٠) و كان (٤٥.٩) للمعدل (٠,٠,٠).

ب- ان جميع المبيدات المستخدمة و هى (الأشوك-البوفريا-الأكترا والملاثيون) حققت تأثيرا متوسطا فى مكافحة التريبس ممثلة بنسب الفقد فى التعداد و هى على التوالى (٦٣%-٦٠%-٥٢%-٣٧%) لعام ٢٠١٣ و (٧٢%-٥٩%-٥٠% -٣٩%) على التوالى لعام ٢٠١٤.

ج- أفضل مبيد هو الأشوك عند عدم زيادة أى من المسمدات (٠,٠,٠) وذلك بعد ٣ و ٧ و ١٤ يوم وذلك بقيم (٦٠%-٦٢%-٦٨%) على التوالى للعام ٢٠١٣ و (٥٨%-٦١%-٧٦%) لعام ٢٠١٤.

د- أقل مبيد هو الملاثيون عند عدم زيادة أى من المسمدات (٠,٠,٠) وذلك بعد ٣ و ٧ و ١٤ يوم وذلك بقيم (٤١%-٤٢%-٤٨%) على التوالى لعام ٢٠١٣ (٣٣%-٣٩%-٤٣%).

