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## EFFECT OF AN INTERCROPPING (*Tomato/squash*) AND MODIFIED LIGHT MINERAL OIL AGAINST WHITEFLY POPULATION.

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### ABSTRACT

For protecting the tomato plants from virus infection caused by *Bemisia tabaci* that caused loss in yield, tomato and squash seedling implanted on the two sides of every row. This ecological method alone could protect the tomato plants against virus infection more than 45 days after implantation, this indicated as diminution of virused tomato plants percentage 38% in the intercropping field whereas 88% in the soled tomato field.

Another chemical treatment applied using for local modified light mineral oil (MMO) named ALOTEC which is under recommendation. This application to either squash/tomato intercropping or soled tomato field resulted in another diminution in virused tomato plants percentages to 12% in the case of intercropping pattern field and 19% in the soled tomato field.

### INTRODUCTION

During the 20 years ago the damage of the white fly *B. tabaci* (Gennadius) arose to become as a major pest for certain economic and strategic crops owing to the loss resulted in crop yields.

All the insecticidal treatment against this pest caused certain periodic and expensive system either in open or protected agricultures. The biological control and integrated control systems which depend on parasitoids and the use of high tolerance virus seeds, also the agriculture hygiene and crop structural (Ezueheret and Taylor (1984), underswing (Theunissen, 1997a and b) neighborhood (Atta *et al.*, 1983) and intercropping pattern also used certain trials were conducted for either insecticidal pest resistance (case of white fly, Prabhaker *et al.* (1988) or to decrease the insecticidal rates used case of *Spodoptera littoralis*, Inshoaga *et al.* (1983) case of *Agrotis ipsilon* and *Gryllotalpa gryllotalpa* Youssef (1997 a and b) using for Alum and Borax and case of white fly using for light mineral oil and insect growth regulators Youssef (1999 a and b).

In Nigeria Malterson (1982) studied the effects of intercropping with cereal and minimal permethrin applications on insect pests of cowpea and their natural enemies.

The present work was conducted to study the effect of an intercropping (tomato/squash) pattern and a local modified light mineral oil compound on the abundance of white fly population in tomato fields, also to protect the tomato plants against virus infection.

## MATERIALS AND METHODS

This study was established in tomato fields at Sharkia Governorate during fall implantation to determine the effect of an intercropping pattern: tomato/squash as a method to protect tomato crop against virus infestation caused by *Bemisia tabaci* (GENNADIUS) adults also to study the efficiency of new mixture Alotec (based on ¼% of light mineral oil + non toxic synergistic soalts). On the abundance of white fly adults population two areas, every one at 12 Kirat, which not surrounded by other preferable crops either for oviposition or survival for white fly adults, were selected. The two areas divided into 2 blocks, every block divided into 4 replicates (then every replicate was about 250 m<sup>2</sup>), one area was not treated by Alotec whereas the other area treated by it. One of the two areas blocks implanted by tomato/squash, the other one was soled tomato implantation. The squash seeds implanted 10 days before the tomato seedlings implantation. The squash and tomato plant were on the same raw, every one on each side of raw. The squash plants on the Northern side (against the wind direction) for protecting the tomato plants (tomato variety was GS 21, Squash variety was Eskandrani). The same agricultural technique was conducted in both treated and untreated area.

### Determination of White fly adults population density:

Two parameters were used to determine the white fly adult population density: Firstly of white fly adult counted on either 10 leaves of tomato plants or 1 leaf of squash plants for every replicate were registered in Table 1. Secondly the use of yellow adhesive traps placed in every replicate (five traps were used: one in the center and four in the sidal positions) the area of every trap was 225 Cm<sup>2</sup>, the number of white fly adult adhesived on 10 Cm were registered in Table 1. The number in the two cases the counting white fly adults were conducted in the early morning during the days of observation. A plastic sheet covered by very thin layer of gras while was used under the lower surface of leaves, and by the aid of a plastic regular bit on the upper surface leaf for 3 times was could counted the white fly adult number on every plant leaf (Youssef, 1999a). The observation conducted during the period between August 21 and November 7, 1999. Alotec mixture 1% (its structure based on ¼% of light mineral oil and ½% of nontoxic synergistic salts) was used as spray solution as the rate of 1% of spray volume; using for dorsal spray motor, one time every 7 – 10 days. The results were statistecaly analyzed by Henderson and Tilton formula (1955).

## RESULTS AND DISCUSSION

Table (1) declared the number of white fly adults was counted on either 10 tomato leaves or 1 squash leaf in 2 patterns of implantation tomato/squash intercropping system or soled tomato pattern. The white fly adults number collected from 10 Cm<sup>2</sup> of yellow adhesive traps (15 cm x 15 cm) placed in the areas conducted. The number of white fly adults which was registred on either treated or untreated tomato/squash and treated or untreated soled tomato,

also the virused tomato plants percentages at the season end cited in Table 1.



The results revealed that there were a significant depression in the number of white fly adults counted on either 10 tomato leaves or 1 squash leaf between the 2 patterns conducted (L.S.D = 128.67) during the days of observations. Also between the white fly adults numbers counted on 10 Cm<sup>2</sup> of the yellow adhesive traps placed on the 3 different areas under study.

The results declared that there was a significant differences between the percentages of virused tomato plants in the tomato fields under the 2 patterns studied. More probably conclusion could given that the squash plants can protected the tomato plants from virus infection (by decreasing white fly adults population) at least during the first 45 days after seedlings implantation.

The treatments occurred using for Alotec mixture showed more than 90 – 97% reduction in the white fly adults number either counted on tomato and squash leaves or caught by the yellow adhesive traps. This reduction occurred translated the increase of the healthy plants and the tomato crop produced in the 2 patterns under studied.

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دراسة تأثير معاملة بيئية كيميائية فى حقول الطماطم على مجموع الذبابة البيضاء .  
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أجريت دراسة حول استخدام نظام تحميل نباتات طماطم مع نباتات كوسة على جانبي الخط الواحد بقصد حماية محصول الطماطم ضد الإصابة الفيروسية الناتجة عن تواجد الحشرات الكاملة للذبابة البيضاء . وقد أظهرت النتائج نجاح تلك الوسيلة لخفض تعداد الحشرات الكاملة للذبابة البيضاء على الطماطم وبالتالي حماية ٦٢% من نباتات الطماطم من الإصابة الفيروسية عنه فى حالة زراعة الطماطم منفردة . كذا تم استخدام مخلوط جديد (الوتك) الخالى من المبيدات وأساس تركيبه ربع فى المائة زيوت معدنية وربع فى المائة منشطات كيميائية آمنة الاستخدام والذى أدى إلى خفض تعداد مجموع الذبابة البيضاء إلى ٩٠ – ٩٧% .



**Table (1): Effect of tomato/squash intercropping pattern and modified mineral oil (MMO) on *Bemisia tabaci* adult fluctuation indicated by it's account on leaves of tomato plants and squash and on yellow adhesive traps, and also % virused tomato plants/feddan.**

Dates/ observ- ations	Mean number of WF adults counted on:									% Virused tomato plants/feddan				Mean number of WF adults stucked on 10 Cm <sup>2</sup> of yellow adhesive traps					
	Tomato/squash intercropping leaves						Soled tomato leaves			Tomato/squash		Soled tomato		Tomato/squash intercropping fields					
	10 tomato leaves			1 squash leaf			10 Soled tomato leaves			MMO Trea- ted	Untr- eated	MMO Trea- ted	Untr- eated	Number of adults in			Number of adults in		
	MMO Trea- ted	Untr- eated	Redu- ction %	MMO Trea- ted	Untr- eated	Redu- ction %	MMO Trea- ted	Untr- eated	Redu- ction %					MMO Trea- ted	Untr- eated	Redu- ction %	MMO Trea- ted	Untr- eated	Redu- ction %
	Aug-21	1	11	90.90	3	33	90.91	5	144	96.53	12%	38%	19%	88%	9	282	96.81	20	205
28	3	23	86.96	3	45	93.33	5	145	96.55	3					220	96.36	19	221	94.98
Sep-05	3	28	89.26	3	58	94.83	2	199	98.90	8					220	96.36	24	222	89.19
12	6	31	80.65	3	59	94.92	4	181	97.79	4					233	98.28	17	212	91.98
19	1	13	92.31	2	31	93.55	8	193	95.85	5					288	98.26	26	247	89.47
26	1	14	92.86	1	22	95.45	3	183	98.36	6					250	97.60	17	255	93.33
Oct-03	1	19	94.78	3	28	89.29	4	177	97.74	2					241	99.07	18	240	92.50
10	1	16	93.75	2	27	92.59	6	189	96.83	2					185	98.92	18	179	89.94
17	0	5	100.0	1	20	95.00	7	188	96.28	2					179	98.88	18	166	89.16
24	0	4	100.0	1	18	94.44	8	93	91.40	2					81	97.53	16	79	79.75
31	0	2	100.0	1	19	94.37	8	108	92.59	3					40	92.50	8	33	93.94
Nov-07	0	1	100.0	1	18	94.44	1	14	93.85	2					11	81.82	3	14	78.57