EFFECT OF THE INSECT GROWTH REGULATOR ADMIRAL ON THE DIFFERENT STAGES OF THE WHITEFLY INFESTING TOMATO PLANTS .

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Abstract

The efficiency of five sprays of the Juvenile hormone mimic, Admiral. (Pyriproxfen) were applied at the recommended rate and diluted to half and quarter rate, on the different developmental stages, (eggs, immatures and adults) of the whitefly infesting tomato plant at the late season of 1995. The results were compared with five recommended chemical insecticides, namely Selecron, Osbac, Admire, Actellic and Reldan. The results indicated that Admiral, at its recommended dose was as good as the different insecticides used in the control of whiteflies and decrease virus symptoms, and thus can be integrated in IPM program.

INTRODUCTION

The whitefly, Bemisia tabaci (Genn.) is a serious pest of tomato plants in Egypt. It causes direct as well as indirect damage to tomato plants, by direct sucking of the plant juice or by transmitting tomato yellow leaf curl virus (TYLCV) (Darwish *et al.*, 1989).

There is a growing demand in pest control for the wide application of integrated pest management (IPM) techniques. IPM is an approach that combines all various tools and methods to manage pests at an acceptable level. Now, Admiral is a product that is ideal for use as part of IPM strategies with little or no adverse effect on beneficial insects, plants and the environment.

Admiral is a biorational insect growth regulator (Juvenile Hormone Mimic, JHM) which causes the disturbance of hormone balance and hinders the completion of the insect life cycle. Admiral as JHM inhibits the development of eggs and repoduc-

tion in the female body and shows ovicidal and sterile activity. It can also be used as part of complete IPM program in conjunction with biological insecticides and cultural methods.

In this investigation, the effects of Admiral applied at the recommended dose, half and quarter of this dose against the different stages of the whitefly compared with five recommended chemical insecticides were studied at Etay El-Baroud Agricultural Research Station during 1995 season.

MATERIALS AND METHODS

Tested compounds and rates

a. The insect growth regulator compound (Admiral)

The common name : Pyriproxfen

The chemical name : 4-phenoxyphenyl (Rs)-2- (2-yridyloxy) propyl ether, 10% EC.

It was applied at rates of 100, 50 and 25 ml/100 liters water.

b. Chemical insecticides

Selecron	72% EC	at rate of 375 ml/100 liters water.
Osbac	50% EC	at rate of 625 ml/100 liters water.
Admire	20% SL	at rate of 250 ml/100 liters water.
Actelic	50% EC	at rate of 750 ml/100 liters water.
Reldan	40% EC	at rate of 600 ml/100 liters water.

Techniques used

The tested compounds were sprayed on tomato plants with the mentioned rates at Etay El-Baroud Agricultural Research station in 1995 season. An area of half feddan was divided into 36 plots (each about 50 m2) in a randomized block design. Spraying was carried out against the different stages of the whitefly, the first spray on 5/8/1995. A knapsack sprayer equipped with one nozzle was used. The efficiency of Admiral and the five recommended insecticides against the adult stage was determined by counting the insects on the upper surface of 75 leaves. The efficiency against immature stages and eggs was tested by taking 75 randomized leaves/plot. These leaves were kept in a paper bag and were immediately examined by using a binocular microscope in the laboratory. Virus symptoms/100 plants were recorded for each treatment 30 and 60 days after planting.

RESULTS AND DISCUSSION

The efficiency of five sprays of the insect growth regulator Admiral applied at the recommended rate and diluted to half and quarter rates on different stages of the whitefly infesting tomato plants at the late season of 1995 compared with five recommended insecticides, is summarized in Table 1 .

The results indicated no significant differences in the efficiency between the recommended rate of Admiral and the recommended rate of the five chemical insecticides. On the contrary, there were significant differences between half and quarter rates of Admiral and the recommended rate. Admiral at the recommended rate gave 91.48%, 89.27% and 85.00% reduction for eggs, immaturs and adults of the whitefly, respectively .

These results are in agreement with those of Schneiderman and Gilbert (1964), Staal *et al.*, (1973), El-Ansary and El-Zoghby (1981), Johansen and Mayer (1990), who showed that IGRs kill young insects as they develop when they shed their exoskeleton and moult.

Concerning the number of plants which showed virus symptoms 30 and 60 days after planting, statistical analysis of the data proved that Admiral decreased virus transmission. As for the recommended rate, the number of plants which showed virus symptoms were 10% compared with 88% in control. These results are in accordance with Omar et al. (1993) and Hayder *et al.* (1995), who showed that there are interrelationship between whitefly population and the incidence of TYLCV (tomato yellow leaf curl virus).

It may be concluded that Admiral can be applied at the recommended rate for controlling the different stages of the whitefly and decreasing virus symptoms.

Table 1. Effect of different JHM rates (Admiral) compared with five recommended insecticides against different stages of B.tabaci on tomato plants, 1995.

Insecticide	Rate/100 liters water	Mean % reduction									General effect on three stages	% virus/100 plants		
		Egg stage			Immature stage			Adult stage				30 days old	60 days old	Mean
		Pretreat.	Posttreat.	%	Pretreat.	Posttreat.	%	Pretreat.	Posttreat.	%				
Admiral 10%	100 ml	22174	580.93	91.48a	10192	413.58	89.27a	19215	474.02	85.00a	88.58a	7	13	10.0 a
	50 ml	22112	637.80	78.59b	10175	607.00	75.10b	19118	1122.50	73.22b	75.64b	15	21	18.0 b
	25 ml	22205	1135.50	71.90b	10140	885.90	71.27b	19306	1267.00	66.70b	69.96b	14	26	20.0 b
Selecron 72%	375 ml	22121	305.33	95.82a	10119	315.08	93.09a	19152	274.90	91.40a	93.44a	8	14	11.0 a
Osbac 50%	625 ml	22178	458.90	93.60a	10138	528.73	91.97a	19005	430.72	91.57a	92.38a	9	15	12.0 a
Admire 20%	250 ml	22158	546.78	90.42a	10215	459.08	91.49a	19214	404.01	90.84a	90.92a	11	19	15.0 a
Actellic 50%	750 ml	22201	440.35	90.46a	10115	587.43	91.89a	19116	450.35	87.92a	90.09a	12	21	16.5 b
Reldan 40%	600 ml	22173	793.28	92.18a	10145	569.65	90.11a	19111	505.32	87.22a	89.94a	13	24	18.5 b
Control		22137	34251.3		10045	12196.4		19112	21622.9		22690.21	80	96	88.0 c

- Residual effect is the average of five sprays, after 3,5 and 7 days of treatment on 300 leaves (75 leaves x 4 replicates).
- The reduction % in population density is calculated according to Henderson and Tilton (1995).
- Means followed by the same letter in each column are not significantly different according to Duncan multiple range test at 5% level.

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تأثير منظم النمو الحشري (أدميرال) علي الأطوار المختلفة للذبابة البيضاء علي نبات الطماطم

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أجري هذا البحث في نهاية موسم ١٩٩٥ لدراسة تأثير التركيزات المختلفة لمنظم النمو الحشري (أدميرال) علي الأطوار المختلفة للذبابة البيضاء علي نباتات الطماطم بالمقارنة مع المبيدات الموصي بها وهي سيلكرون ٧٢٪ مركز قابل للاستحلاب ، أوسباك ٥٠٪ مركز قابل للاستحلاب ، أدميرال ٢٠٪ ، اكتيلك ٥٠٪ مركز قابل للاستحلاب ، ريلدان ٥٠٪ مركز قابل للاستحلاب.

وقد أظهرت هذه الدراسة أنه لا يوجد فرق معنوي بين تأثير الجرعة الموصي بها لمنظم النمو الحشري وبين المبيدات المختبرة ضد الأطوار المختلفة للذبابة البيضاء، وأوضحت النتائج أيضا أن الأدميرال خفض تعداد النباتات التي ظهرت عليها أعراض فيروسية وذلك بالمقارنة بالكونترول.

ولذا يمكن استعمال الأدميرال بالجرعة الموصي بها لمكافحة الذبابة البيضاء والحد من الأعراض الفيروسية .

ويعتبر الأدميرال كمنظم نمو حشري عنصراً هاماً من عناصر المكافحة المتكاملة.