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INFLUENCE OF THREE MINERAL OILS AND OTHER COMPOUNDS ON THE POPULATION OF THE CITRUS RUST MITE, *PHYLLOCOPTRUTA OLEIVORA* ASHMEAD AND THE CITRUS BROWN MITE, *EUTETRANYCHUS ORIENTALIS* (KLEIN).

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Abstract

The effect of three mineral oils; Star oil, Shokrona oil and Shokrona Super, as well as Vertimec (abamectin 1.8% E.C., natural product produced by the soil microorganism, *Streptomyces avermitis*) and Dithane M-45, against the citrus rust mite *Phyllocoptruta oleivora* and the citrus brown mite, *Eutetranychus orientalis* was evaluated.

Results indicated that Dithane M-45 was the most effective compound in reducing citrus rust mite population and produced the least percentage of russetted fruits. Vertimec came next, followed by Shokrona Super, Star oil then Shokrona oil. Vertimec was the most toxic compound against the citrus brown mite followed by Shokrona Super, Star oil then Shokrona oil.

INTRODUCTION

Recently, Dithane M-45 and Kelthane were found to be highly effective against citrus rust mite, citrus brown mite and citrus flat mites. Phosphorus compounds used as summer sprays against scale insects, mealy bugs and fruitflies infesting citrus trees were found to cause the build up of citrus mites (Attiah and Wahba , 1971).

The increasing use of different acaricides and insecticides in controlling injurious mites and insects, are main factors causing hazards to man and decrease natural enemies population.

This paper deals with the effect of some mineral oils as well as the biological compound Vertimec (abamectin 1.8%) on the citrus rust mite, *Phyllocoptruta oleivora* Ashmead and the citrus brown mite, *Eutetranychus orientalis* (Klein).

MATERIALS AND METHODS

Two groves of navel orange trees were chosen , one at Kaha Qualubia Governorate and the other at Hosh Eisa, Behera Governorate during 1990 season. The first experiment included 90 trees highly infested with the citrus brown mite, *E. orientalis*, and the second experiment included 96 trees highly infested with the citrus rust mite, *Ph.oleivora*. The first grove was divided into five treatments and six treatments were used in the second. In the two experiments , every treatment contained four replicates each having four trees. The trees received one application on August 1st, 1990 (first experiment), and on September 3rd, 1990 (second experiment) by using a motor sprayer. The check treatment was left unsprayed. Mite counts were started just befor treatments (pre-count), then at weekly intervals after treatment along one month. Each sample included 20 leaves per replicate totalling 80 leaves per treatment for the first experiment, and 8 fruits per replicate making a total of 32 fruits per treatment for the second experiment. Similar pre-count was done before spraying to estimate the percentage reduction in mite population by using Henderson and Tilton equation (1955).

The materials and their rates of use in 100 litres of water were, Star oil (1.5l), Shokrona oil (1.5 l.), Shokrona Super (1.5l.), Vertimec (30cc) and unsprayed control. Dithane M-45 (120g) was used in the second experiment . At the end of the second experiment, the number of russetted and healthy fruits were recorded for each treatment.

RESULTS AND DISCUSSION

As indicated in Table 1, Vertimec and Shokrona Super showed a reduction in the citrus brown mite population (83.81 and 82.28 %, respectively). Star oil showed a reduction of 79.75 % while Shokrona oil was the least effective giving

Table 1. Population of *E. orientalis* before and after spraying.

Spray	No. of mites/80 leaves and % reduction on indicated dates					Average reduction %
	Before Spraying	After spraying				
	1/8	8/8	15/8	22/8	29/8	
Vertimec	878	126 86.00*	132 84.25	158 83.17	166 81.82	83.81
Shokrona Super	919	138 85.00	158 82.15	179 81.19	187 80.81	82.28
Star oil	881	163 82.00	169 80.05	183 80.20	203 76.77	79.75
Shokrona	895	249 73.00	250 71.65	286 69.31	315 64.65	69.65
Control	899	896 ---	853 ---	907 ---	884 ---	-- --

* % Reduction

69.65 % reduction in mite population. Thus, it could be concluded that Vertimec and Shokrona Super were the most effective compounds against the citrus brown mite, *E. orientalis.*

Data in Table 2, show the effect of the tested compounds on *Ph. oleivora* population. Dithane M-45 was the most effective compound in reducing mite population (92.50%). Reduction percentages of mite population in the other treatments were less than 90% as Vertimec gave 87.20% , while Shokrona Super, Star oil and Shokrona oil gave 85.54, 83.84 and 81.00%, respectively.

Table 2. Population of the rust mite *Phyllocoptruta oleivora* before and after spraying.

Spray	No. of mites/32 fruits and % reduction on indicated dates					Average reduction %
	Before Spraying	After spraying				
	3/9	10/9	17/9	24/9	1/10	
Dithane M-45	3316	173 94.95*	221 93.73	317 91.35	394 89.97	92.50
Vertimec 1.8%	3409	180 94.74	260 92.78	502 86.62	1019 74.67	87.20
Shokrona Super	3190	187 94.14	269 92.02	523 85.16	1063 72.46	85.54
Star oil	3129	191 93.83	286 71.35	697 79.75	1091 70.42	83.54
Shokrona	3205	261 91.81	323 90.50	764 78.34	1382 63.36	81.00
Check	3340	3290 --	3487 --	3648 --	3891 -	-- --

* % Reduction

The percentage of russetted fruits compared with the total number of fruits in each treatment is shown in Table 3. These Percentages confirmed those shown in Table2 that Dithane M-45 was the most effective compound in reducing mite population and at the same time was the highest protective product against russetting giving only 0.14% reussetted fruits. The percentages of russetted fruits in case of Vertimec, Shokrona Super, Star oil and Shokrona oil were 5.34 , 6.74, 8.52 and 12.37%, respevctively . In the check the percentage jumped to 47.9% . The previous findings agree with those of Attiah *et al.*, (1971) and Hanna *et al.*, (1975).

Table 3. Percentages of russetted fruits compared with the total number of fruits in different treatments.

Treatments		Replicates					Average of russetted fruits %
		1	2	3	4	Total	
Dithane M-45	T.	785	496	904	574	2683	
	R.	6	2	5	3	16	0.14
	%	0.79	0.40	0.60	0.52	0.57	
Vertimec	T.	545	781	904	851	3081	
	R.	28	36	62	41	167	5.34
	%	5.13	4.60	6.85	4.81	21.39	
Shokrona Super	T.	337	456	483	615	1981	
	R.	17	32	47	39	135	6.74
	%	5.04	5.86	9.73	6.34	26.97	
Star oil	T.	671	713	533	416	2333	
	R.	58	63	49	31	201	8.52
	%	8.64	8.83	9.19	7.45	34.11	
Shokrona oil	T.	801	625	493	545	2464	
	R.	92	88	72	51	303	12.37
	%	11.48	17.08	14.60	9.35	49.51	
Control	T.	675	871	593	714	2853	
	R.	321	385	291	363	1360	47.91
	%	47.55	44.20	49.07	50.84	191.66	

T = Total no. of fruits
R = Russetted fruits
% = Percentage reduction of russetted fruits

REFERENCES

1 . Attiah, H. H. and M.L. Wahba, 1971. Phosphorus compounds as a cause of flat mite increase. Proc. 3rd Int. Cong. Acarol., Prague.

2 . Attiah, H.H., M.L. Wahba and S. M. Kodirah, 1971. Chlorobenzilate as an acaricide of wide spectrum against tcitrus mites. Proc. 3rd Int. Cong. Acarol, Prague.

3 . Hanna, M.A., M.A. Abdel -Hafez and M.L. Wahba, 1975. Influence of thiocarbamate fungicides on population of citrues rust mite *Phyllocoptruta oleivora* Ashmead. Res. Rev., 53 (1) : 181 - 186.

4 . Henderson, C F. and E. W. Tilton, 1955. Test with acaricides against the brown wheat mite. J. Econ. Entomol., 84: 157 - 161.

تأثير فاعلية ثلاث زيوت معدنية وبعض المركبات الأكاروسية علي تعداد أكاروس صدأ الموالح *Phyllocoptruta oleivora* Ashmead وأكاروس الموالح البني *Eutetranychus orientalis* (klein)

صوفي ميخائيل ابراهيم

معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقي

تم اجراء تجربتين حقليتين لتقييم تأثير ثلاثة زيوت معدنية (ستار أويل وشكرونا أويل وشكرونا سوبر) واثنين من المركبات هما الفيرتيميك وهو مركب طبيعي منتج بواسطة البكترية ستربتوميسيس أفيرميتيس، ومبيد دياثين م ٤٥ ضد أكاروس صدأ الموالح ***Phyllocoptruta oleivora Ashmead*** بمحافظة القليوبية، وأكاروس الموالح البني ***Eutetranychus orientalis*** بمحافظة البحيرة.

وأظهرت النتائج أن الدياثين م ٤٥ كان أكثر المواد تأثيراً في تقليل أعداد أكاروس صدأ الموالح متبعاً بمركب فيرتيميك ثم شكرونا سوبر ويليه ستار أويل وأخيراً شكرونا.

وكان المركب فيرتيميك أكثر المركبات فعاليه ضد أكاروس الموالح البني متبوعاً بالمركب شكرونا سوبر ثم ستار أويل وأخيراً الشكرونا.