

FIELD POTANACY OF ACARICIDES AGAINST SPIDER MITE TETRANYCHUS URTICAE KOCK WITH THEIR SIDE EFFECT ON PREDACIOUS MITES ON SOYBEAN PLANTS

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ABSTRACT

Field experiments were carried out to study the efficacy of seven acaricides against the two spotted spider mite *Tetranychus urticae* kock with refer to their side effect on predaceous mites on soybean plants during 1999 and 2000 seasons in Assiut Governorate.

The obtained results clearly showed that all tested materials gave over 90% mortality of spider mite population after three days of spray, but in different trend. Residual activities on spider mites could be arranged in descending order as follows; vertimec, Endo, Ortus, Sunmite, propergate, neoron and Dicofol, while the side effect of tested materials on predator mites cleared that vertimec gave the highest mortality, followed by neoron, endo, sunmite, ortus, dicofol and propergate, percentages of reduction being 39.96, 39.92, 38.03, 36.50, 34.64, 33.70 and 31.87% respectively.

INTRODUCTION

Soybean, *Colycin max* Merr has received special attention all over the world because of its great nutritive value. Spider mites are considered the main pests which threaten soybean plants and cause great damage in the crop yield in addition to the seeds quality; Sawires (1983).

Mites infesting soybean have been studied by many authors in Egypt. Zahar *et al.* (1980), Sawirs *et al.* (1990 & 1991), Taha *et al.* (1993 & 1995), they reported that mite population reached its peak during the flowering and pod formation stages.

In abroad, Van-Dinther (1956), Ratcliffe *et al.* (1960) reported that spider mites are very serious pests attacking soybean crop.

In this respect Ismail *et al.* (1985) mentioned that the tow common spider mites *T. urticae* and *T. cucurbitacearum* (Sayed) are usually encountered in soybean fields, therefore chemical control of spider mites are an old tool and still necessary to be used as an effective method to reduce mite population.

The present work carried out to evaluate the effect of seven acaricides against the spider mite *T. urticae* with their side effect on the associated predacious mites on soybean plants.

MATERIALS AND METHODS

An area of feddan was cultivated with clark soybean variety during the seasons 1999 and 2000 at Assiut Governorat. The area was divided into 32 plots each of 1/32 feddan and arranged in four completely randomized blocks. Each materials was used in treating one randomized plot in each block while four plots were left untreated as controls.

All materials were applied only one time using "Solo bock motor sprayer" at rate of 150 litter per feddan. Spraying was conducted on 16/6/1999 and 20/6/2000 or after 60 days from sowing date.

Sampling of examination of the spider mites was done, three days, one, two and three weeks after acaricide spraying. On each sampling date, ten leaflets were collected at random at different heights from the plants existing in the middle of each plot (i.e. 40 leaflets each treatment). A sample of two square inches was taken from the area around the midrib of each leaflet where the mite infestation is usually found. The numbers of motile stages of spider mite and predators were counted in each sample by using stereoscope-Microscope. The reduction percentages in populations were estimated according to the equation of Handers and Tilton (1955).

RESULTS AND DISCUSSION

A. Evaluation of seven acaricides against spider mite *T. urticae* Koch on soybean plants.

Tables (1 & 2) provide the average of mite populations per 40 square inches and percentages of reduction mortality of various materials.

Obtained results in tables (1,2) clearly indicated that after three days of spraying vertimec gave the highest initial kill followed by Endo, ortus, sunmite, propergate, Neoron and Dicofol, percentages of reduction being (96.82 & 97.46), (96.19 & 96.5), (95.45 & 95.6) (94.47 & 94.26), (93.28 & 94.65) (92.01 & 91.9) and (91.8 & 91.3) during the 1999 and 2000 seasons respectively. A week after spraying, the efficacy of all tested acaricides expressed as percentages reduction of spider mite population a slight decrease ranged between 1.5 and 3.0%.

Two weeks after spraying also vertimec gave the highest reduction in mite population (91.44 & 91.85%) during 1999 & 2000 seasons respectively while Dicofol gave the lowest reduction (83.66 & 85.76) at the same patterns.

Three weeks after spraying vertimec gave 84.7 during 1999 and 89.29% during 2000 seasons, Endo gave (83.44 & 87.09) while the lowest one Dicofol gave 77.34 and 78.15% during 1999 & 2000 seasons, Tables (1 & 2).

Regarding the residual activity data presented in table (1) indicated that the residual activity of the different compounds gave over 85.0% and could be arranged in descending order as follows: 92.07, 91.16, 88.72, 87.19, 87.01, 85.75 and 85.61% during the season 1999, while during the season 2000 the mean of residual activity were: 93.4, 91.76, 89.34, 88.6, 87.75, 87.5 and 86.56% for vertimec, Endo, ortus, sunmite, propergatu, Neoron and Dicofol.

The average percentages of reduction during the two seasons data cleared vertimec gave. The highest reduction in spider mite population (91.9%) while Dicofol gave the less one (86.0%).

B. The side effect of tested acaricides on predator mites during the season 2000 on soybean plants:

The side effect of tested acaricides was evaluated against the predator mites *Amblyseius swirskii* (Athais Heriot), *Amblyseius sp.*, *Agistemus exsertus* (Gonzalez) and *Cheyletus sp* where they found associated with spider mites infesting soybean plants during the season 2000 (Table 3) obtained data cleared that all materials were effective on predacious mites, but in different level.

1,2

Whereas vertimec gave high initial kill (50.3%) mortality followed by neoron (48.6%), sunmite (46.4%), ortus 45.4%), dicofol (42.5%); Endo 38.8%) and propergate (37,9%).

The residual effect of tested acaricides were (38.8%) for vertemic and (29.9%) for propergate, while the average percentages of reduction could be arranged in descending order as follows: vertemic (39.96%), neoron (39.92%), endo(38.03%), sunmite(36.5%), ortus(34.64%), dicofol (33.7%) and propergate(31.87%).

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الكفاءة الحقلية لبعض المبيدات الأكاروسية لمكافحة العنكبوت الأحمر العادى على نباتات فول الصويا و أثرها الجانبى على المقترسات الأكاروسية المصاحبة لها
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أجريت هذه التجارب بمحافظة اسيوط موسم ١٩٩٩ ، ٢٠٠٠ م و ذلك للتقييم الحقلى لسبعة مبيدات اكاروسية لمكافحة العنكبوت الأحمر العادى النوع الأخضر على نباتات فول الصويا ، و لقد أوضحت النتائج المتحصل عليها أن مركب الفيرتيميك ١,٨ أعطى اعلى نسبة إبادة ٩٢,٠٧% ، ٩٣,٤١% خلال عامى ١٩٩٩ ، ٢٠٠٠م و كان أقل هذه المركبات فى نسبة الإبادة هو مركب ديكوفول ١٨,٥% حيث أعطى نسبة إبادة فى تعداد العنكبوت الأحمر العادى ٨٥,٦١% ، ٨٦,٥٦% خلال عامى ١٩٩٩ ، ٢٠٠٠م. و جاءت المركبات إندو ٥٠% ، اورتس ٥% ، سانميت ٢٠% ، بروجيت ٧٣% ونيرون ٥٠% على نفس الترتيب بين الفيرتيميك و الديكوفول حيث اعطت معدلات إبادة ٩١,١٦% ، ٨٨,٧٢% ، ٨٧,١٩% ، ٨٧,٠١% ، ٨٥,٧٥% خلال عام ١٩٩٩ . بينما خلال عام ٢٠٠٠م اعطت متوسطات إبادة ٩١,٧٦% ، ٨٩,٣٤% ، ٨٨,٦٣% ، ٨٨,١٨% ، ٨٧,٥٣% على نفس الترتيب كما ان هذه المركبات اعطت تأثيرات جانبية على المقترسات الأكاروسية يمكن ترتيبها تنازليا على النحو التالى: الفيرتيميك – نيرون – اندو – سانميت – اورتس – الديكوفول واخيرا بروجيت و كانت متوسطات الإبادة على نفس الترتيب ٣٩,٩٢% ، ٣٨,٠٣% ، ٣٦,٥% ، ٣٤,٦٤% ، ٣٣,٧% ، و اخيرا ٣١,٨٧%.

Table (1): Effect of 7 acaricides on the moving stages of *T. urticae* koch on soybean plants during the first season 1999

Tested Acaricides	Rate of application /100 liter of water	No. of Mites Before treatment	Number and percentage of mite after treatment								Average of reduction %
			3 days		One week		Two weeks		Three weeks		
			No.	R%	No.	R%	No.	R%	No.	R%	
Vertimec 1.8% EC.	40 cc.	907	28	96.82	37	95.29	51	91.44	69	84.72	92.07
Endo 50% EC.	150 cc.	946	35	96.19	49	94.02	56	90.98	78	83.44	91.16
Ortus 5% EC.	50 cc.	927	41	95.45	59	92.65	81	86.69	92	80.07	88.72
Sunmite 20%wp.	100 gm.	894	48	94.47	66	91.47	89	84.84	98	77.98	87.19
Propergate 73% EC.	150 cc.	873	57	93.28	67	91.13	78	86.39	99	77.22	87.01
Neoron 50% EC.	150 cc.	889	69	92.01	78	89.86	91	84.41	103	76.73	85.75
Dicofol 18.5% EC.	250 cc.	904	72	91.8	81	89.65	97	83.66	102	77.34	85.61
Control	-	952	925		824		625		474		-

Table (2): Effect of 7 acaricides on the moving stages of *T. urticae* koch on soybean plants during the second season 2000.

Tested Acaricides	Rate of application /100 liter of water	No. of Mites Before treatment	Number and percentage of mite after treatment								Average of reduction %
			3 days		One week		Two weeks		Three weeks		
			No.	R%	No.	R%	No.	R%	No.	R%	
Vertimec 1.8% EC.	40 cc.	1407	30	97.46	54	95.03	69	91.85	76	89.29	93.41
Endo 50% EC.	150 cc.	1412	41	96.54	68	93.76	88	89.65	92	87.09	91.76
Ortus 5% EC.	50 cc.	1392	51	95.64	91	91.53	108	87.11	119	83.06	89.34
Sunmite 20%wp	100 gm.	1287	62	94.26	84	91.55	98	87.35	121	81.37	88.63
Propergate 73% EC.	150 cc.	1402	63	94.65	97	91.04	121	85.67	132	81.34	88.18
Neoron 50% EC.	150 cc.	1262	85	91.98	88	90.97	105	86.18	121	81.00	87.53
Dicofol 18.5% EC.	250 cc.	1306	95	91.34	91	90.98	112	85.76	144	78.15	86.56
Control	-	1435	1205		1108		864		724		-

Table (3): Side effect of different acaricides on some predacious mites during the season 2000.

Tested Acaricides	Rate of application /100 liter of water	No. of Mites Before treatment	Number and percentage of mite after treatment								Average of reduction %
			3 days		One week		Two weeks		Three weeks		
			No.	R%	No.	R%	No.	R%	No.	R%	
Vertimec 1.8% EC.	40 cc.	216	118	50.36	132	46.03	149	32.86	128	30.60	39.96
Neoron 50% EC.	150 cc.	228	129	48.59	137	46.94	151	35.54	139	28.60	39.92
Endo 50% EC.	150 cc.	236	159	38.78	145	45.74	155	36.07	138	31.52	38.03
Sunmite 20%wp.	100 gm.	234	138	46.41	152	42.64	161	33.03	152	23.93	36.50
Ortus 5% EC.	50 cc.	213	128	45.39	145	39.89	155	29.17	138	24.12	34.64
Dicofol 18.5% EC.	250 cc.	226	143	42.50	159	37.87	166	28.51	143	25.90	33.70
Propergate 73% EC.	150 cc.	224	153	37.93	161	36.53	171	25.70	139	27.33	31.87
Control	-	219	241		248		225		187		-