

EVALUATION OF THE PREDACEOUS MITE *PHYTOSEIULUS PERSIMILIS* (A.-H.) RELEASE ON PEACH AND ALMOND TREES AT NORTH SINAI GOVERNORATE TO CONTROL THE TWO SPOTTED SPIDER MITE *TETRANYCHUS URTICAE* KOCH

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Abstract

In a field study, the predatory mite, *Phytoseiulus persimilis* (A.H.) was released, 30-50 predator/tree, on peach and almond trees in two feddans to control the two spotted spider mites *Tetranychus urticae* Koch. at North Sinai. During 2003 and 2004 seasons, percent reduction of *T. urticae* on peach reached 96.6% & 87.1%, while on almond reached 98.33% - 85.8%. after three and four months of release through the two seasons, respectively .

INTRODUCTION

Peach and almond are the important horticultural crops in North Sinai, Egypt. In the year 2003 and 2004 the total cultivated area increased from 59001 to 59048 feddans for peach and from 11143 to 12320 feddans for almond. The total production of peach fruits was 150049 ton in 2003 and 176442 ton in 2004. While the total production of almond fruit 17009 ton in 2003 and 17272 in 2004 according to Ministry of Agriculture Statistics (2003 and 2004)

Several major pests infest peach including the spider mite *T. urticae* Koch and the eriophid mite *Aculus cornutus* (Banks) which cause great damage to leaves and fruits, whereas the pests on almond include *T. urticae* Koch and *Eutetranychus orientalis* Kleim. On the other hand, phytoseiid mite predators are successfully used instead of acaricides, as reported for; *Phytoseiulus persimilis* (Athias-Hemriot) by Oatman 1965 Oatman & McMurtry, 1966, Oatman *et al.*, 1967, 1968, 1977 and Decou, 1994, and for *Amblyseius californicus* (McGregor); and *Typhlodromus occidentalis* Nesbitt by Oatman *et al.*, 1977, Parsad 1967 and Heikal and Mowafi (1998).

Thus, the present work was conducted to determine the effectiveness of release of predatory mite, *P. persimilis* (A.-H.) as a biocontrol agent against of the two-spotted spider mite, *T. urticae* Koch, on peach and almond orchards in north Sinai Governorate, during two seasons; 2003 and 2004.

MATERIALS AND METHODS

The predatory mite *Phytoseiulus persimilis* (A.-H.) was reared on the two-spotted spider mite *T. urticae* Koch maintained on bean seedlings, *Phaseolus vulgaris* (L.) in a green house, Heikal and Mowafi (1998).

An area of about one feddan, of each of peach and almond orchards, was chosen and kept without any pesticide treatment at El-Hosynat Raphah, North Sinai Governorate, For each corp, 12 chosen lines of trees were divided into four replicates; each consisted of three lines with 15 trees. One replicate, comprise 15 trees in three lines, was kept as control; i.e. without predatory release.

While the other replicates were, released with the predator, started on April, 8 2003 at a rate of 30-50 predator/tree, using leaflets of bean as carrier for the predators which collected from the green house production. Randomized samples of 10 leaves / replicate were taken prior to predator release as pre-count and monthly afterwards for a period of one month for both seasons.

The moving stages of each of *T. urticae* and *P. persimilis* were counted. Also, % infested leaves was determined. The preset reduction of mite pest *T. urticae* population was calculated according to Henderson and Tilton (1955).

RESULTS AND DISCUSSION

Population densities of *T. urticae* and *P. persimilis* on peach are shown in table 1 for 2003 season, % infestation of leaves with *T. urticae* prior to predator release was 30-38% with mite population of 9.9-10 moving stages/10 leaves in treated and control plots, respectively.

One month after predator release (May 7), population of the mite pest slightly decreased on treated trees to 3-4 moving stages /10 leaves meanwhile, a noticeable increase to 39.1 moving stages/10 leaves occurred in untreated trees.

Two months after treatment (June 7), further decrease to 1.7 moving stges/10 leaves occurred, while control population increased rapidly to 50.2 moving stages/10 leaves.

One month later (July 7), the natural population reached 61.1 mites/10 leaves, while that in the treated plot averaged 0.5 moving stages/10 leaves.

Leaves % infestation with *T.urticae* averaged 10, 3 and 1.55 after one, two and three month of predator release, compared to 69, 89 and 99.2% for control, respectively.

In 2004 season the population density of *T. urticae* followed the same trend as in the previous season and the reduction of *T. urticae* reached 99.1% after four months of releasing the predator (Table 1).

On almond data in (Table 2) demoestricted that the population densities of *T. urticae* and *P. persimilis* on almond are shown in (Table 2)

During 2003 season, % infestation of leaves with *T. urticae* before the predator release reached 33.3-35.1% with mite pest average 6.1-7 moving stages/10

leaves. One month after predator release (May 7), population density of mite pest slightly decreased on the treated trees averaged 4.6 moving stages/10 leaves, meanwhile, an increase to 20.2 moving stages 10 leaves occurred in untreated trees.

Two months after treatment (June 7), further decrease to 1.4 moving stages/10 leaves occurred, while control population increased gradually to 31.1 moving stages/10 leaves.

One month later (July 7), the natural population reached 42.1 mits/10 leaves while that in the treated plot averaged 0.6 moving stages 10 leaves, with a reduction of 98.33% in *T.urticae* population .

The percentage of leaves infestation, with *T. urticae* in treated plots during 2003 season averaged 10.2, 5.1 and 1.5% after one, two and three months, compared to 87.4, 96.2 and 99.2% for control, respectively.

During 2004 season the population density of *T. urticae* on almond trees fluctuated around the precount (6 moving stages/10 leaves) in the treated plots which reached 6.1, 6.9, 8.7 and 7.3 moving stages /10 leaves after one, two, three and four months from release, respectively, whereas.

The population density of *T. urticae* increased gradually in control treatment with average 20.2, 30.1, 42, and 60.1 moving stages/10 leaves respectively. The reduction percentage of *T. urticae* population reached 85.8 after four months from release in the treated almond trees with % infestation reaching 29% in the inspection leaves.

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Table 1. Effect of *P. persimilis* release on the population density of *T. urticae* infesting peach trees during 2003 and 2004 seasons at North Sinai.

Sampling dates	Plots	No. of <i>T. urticae</i> /10 leaves	% leaves infested with <i>T. urticae</i>	% reduction in <i>T. urticae</i>	No. of <i>P. persimilis</i> / 10 leaves
2003 Season					
April,8 2003	Precount	9.9±0.25	30±0.6	-	-
	Control	10±0.5	38±0.4	-	-
May,7 2003	Treated	3.4±0.3	10±0.4	91.2±0.3	0.5±0.6
	Control	39.1±0.2	69±0.3	-	-
June,6 2003	Treated	1.7±0.5	3±0.5	94.6±0.2	2.0±0.2
	Control	50.2±0.4	89.2±0.2	-	-
Julay,7 2003	Treated	0.5±0.02	1.5±0.2	96.6±0.2	3.0±0.3
	Control	61.1±0.2	99.2±0.1	-	-
2004 Season					
April,6 2004	Treated	9.9±0.1	31±0.1	-	-
	Control	10.1±0.2	34±0.2	-	-
May,7 2004	Treated	13.1±0.3	40±0.3	66.1	2.6±0.1
	Control	39.1±0.2	35±0.11	-	-
June,6 2004	Treated	11.7±0.2	39±0.5	76	1.2±0.2
	Control	50.2±0.3	79±0.2	-	-
Julay,7 2004	Treated	12.1±0.2	40±0.2	80	2.0±0.3
	Control	61±0.4	82±0.3	-	-
Aug.,8 2004	Treated	10.3±0.1	30±0.3	87.1	3.0±0.2
	Control	80.1±0.3	99.1±0.1	-	-

Table 2. Effect of *P. persimilis* release on the population density of *T. urticae* infesting almond trees during 2003 and 2004 season at North Sinai.

Sampling dates	Plots	No. of <i>T. urticae</i> /10 leaves	% leaves infested with <i>T. urticae</i>	% reduction in <i>T. urticae</i>	No. of <i>P. persimilis</i> /10 leaves
2003 Season					
April,8 2003	Precount	6.1±0.2	33.3	-	-
	Control	7±0.3	35.1	-	-
May,7 2003	Treated	4.6±0.2	10.2	63	0.5±0.2
	Control	20.2±0.4	87.4	-	-
June,6 2003	Treated	1.4±0.1	5.1	95	1.9±0.1
	Control	31.1±0.5	96.2	-	-
Julay,7 2003	Treated	0.6±0.2	1.5	98.33	2.1±0.2
	Control	42.1±0.2	99.2	-	-
2004 Season					
April,6 2004	Treated	6±0.1	25.0	-	-
	Control	7.1±0.2	26.1	-	-
May,7 2004	Treated	6.1±0.2	32.2	65	0.2±0.1
	Control	20.2±0.3	52.3	-	-
June,6 2004	Treated	6.9±0.1	26	74.2	1.1±0.2
	Control	30.1±0.2	87	-	-
Julay,7 2004	Treated	8.7±0.3	44	77.4	2.7±0.1
	Control	42±0.2	89	-	-
Aug.,8 2004	Treated	7.3±0.1	29	85.8	3.9±0.3
	Control	60.1±0.2	98.2	-	-

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تقييم المفترس الأكاروسى (*Phytoseiulus Persimilis* (A.-H.)
على أشجار الخوخ و اللوز بمحافظة شمال سيناء
لمكافحة العنكبوت الأحمر العادى (*Tetranychus Urticae* Koch)

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في دراسة حقلية تم إطلاق المفترس الأكاروسى (*Phytoseiulus persimilis* (A.-H.) بمعدل ٣٠-٥٠ فرد/الشجرة لمكافحة العنكبوت الأحمر للعادى *Tetranychus urticae* Koch فى مساحة فدانين، فدان لتجربة اللوز والآخر لتجربة الخوخ منزرعة بمنطقة الحسينات- رفح - محافظة شمال سيناء بإطلاقه واحدة في كل تجربة فى الموسمين ٢٠٠٣، ٢٠٠٤ ولوحظ أن النسبة المئوية للخفض فى تعداد العنكبوتتناسب تناسباً طردياً مع ازدياد الفترة بعد إطلاق المفترس. فكانت في تجربة الخوخ بنسبة ٩٦,٦%، ٨٧,١% لموسمي ٢٠٠٣، ٢٠٠٤ على الترتيب بعد ثلاث شهور من الإطلاق بينما كانت فى اللوز بنسبة ٩٨,٣٣%، ٨٥,٨%، لنفس الموسمين السابقين أربعة شهور من الإطلاق. لذا يمكن أن نوحى بأستخدام المفترسات الأكاروسية لمكافحة العنكبوت الأحمر العادى على أشجار الخوخ واللوز بدلاً من استخدام المبيدات الكيميائية لتلافى الأضرار التي قد تحدث عند إستخدامها.