



OCCURRENCE OF DUST MITE, *OLIGONYCHUS AFRASIATICUS* MEG. ON FRUITS, LEAFLETS OF SOME DATE PALM TREES AND EVALUATION THE EFFICIENCY OF BOTANICAL COMPOUND, (BIACO) AS COMPARED WITH SOME ACARICIDES

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ABSTRACT:

This work was carried out in El-Karg region at Riyadh Governorate, which is representing the whole region, because of the similarity of the terrain, growing conditions and the passage of planting material throughout the years, on fruits & leaflets of some date palm during season 2007.

Occurrence of dust mite, *Oligonychus afrasiaticus* Meg. On date (fruits and leaflets) and evaluation the efficiency of the botanical compound "Biaco" as compared with some acaricides searching for other safer compound for controlling this mite species were studied, during season 2007.

1-Data showed that the active period of *Oligonychus afrasiaticus* mite occurred throughout the period from the first half of March until second half of October 2007. Number of mites/100 date fruits reached its maximum with 9095.5 mites/100 dates on the 26th of July, then population was gradually decreased till the middle of October 124 mite 100 date fruits.

2-The mean percentages of infestation began after the 2nd week of March and reached 3%, while it was in its maximum on the 3rd week of October (80%).

3-Statistical analysis of the data revealed significant differences between botanical compound (Biaco) as compared with the other acaricides (amitraz, vertimec, perpol and salocide). Regardless of fruits date cultivars good results were achieved when applied all acaricides, while Biaco 1-500 ml gave satisfaction results as compared with the other five compounds tested against the dust mite.

4-The reductions of the mite population on leaflets of botanical compound Bicao were 17.6, 3.8, 10.6 and 12.6. Bicao ranked the first number, which Salocide EC (150 mL.) may indicate that they lost their efficacy when applied against this mite species on date cultivars of Nabotsif, Sokary, Kalas and Sakiey date varieties, (26.2, 14.40, 20.10 and 18.80) on leaflets respectively.

INTRODUCTION:

The dust mite, *Oligonychus afrasiaticus* Meg. (Acari: Tetranychidae) is considered one of the most important pest infesting some economic crops in Saudi Arabia. The old world date mite, *O. afrasiaticus*, is a serious pest of dates in North Africa and the Near

East. Palevsky *et al.* (2005) and Talhouk (1991), reported that this mite caused very serious damage to fruits in orchards in Dirab, Unayzah and Al Sulayell districts. It attacks the dates from their early stages of development, spinning its webs around the date bunches and multiplies in big numbers. Dust collected in the webs plus

the exuviae of different development stages of the mite, thus making the dates bunches look dusty (Saleh and Hosny, 1979). It feeds on juices, sucks from the date, rendering them unfit for human consumption (Mohamed, 2005). Hussein (1969) reported that this pest has 6 generations/year, the peak number of the mite was occurred around the middle of July/in Iraq. Gerson *et al.* (1983) observed that *O. afrasiaticus* had been found on the grasses *Cynodon dactylon* (L.) and *Impeata cylindrical* (L) planted among date palms in Israel. The infestation of this mite species usually starts around mid of May to June when it builds dusty, creamy silken webs on date bunches around stands date fruits, where adults and immatures live.

Sever infestation with mite resulting in economic reduction in the quality and quantity of crop production. Although chemical control of mites is an old tool, it is yet still necessary for controlling the pest as an effective method.

Many acaricides are available in the Saudi markets in order to control the mite on date palm trees but their efficacy against the date mite is questionable (Palevsky *et al.*, 2003 and Mohammed, 2005).

Thus, the present work aimed to study the occurrence and fluctuation of date palm mite, in addition to evaluate the efficiency of the potential compound "Biaco" and some acaricides against dust mite.

MATERIALS AND METHODS:

The occurrence and fluctuation of date dust mite, *O. afrasiaticus* on date fruits:

This experiment was carried out in El-Karg region at Riyadh Governorate.

Samples of one hundred date fruits was collected from each of the 2 date palm cultivars (Nabotsif and Sokary) during season 2007.

Samples were periodically taken at seven days intervals from the 2nd week of March, until the 3rd week of November 2007.

The mites were removed using fine brush onto slide, then counted by means of stereo-binocular microscope and percentages of infestation of the different sampling dates were recorded.

The efficiency of botanical compound, (Biaco) as compared with some chemical acaricides against *O. frasiaticus* on fruits and leaflets of some date palm cultivars:

A-On Date fruits:

The experiment was carried out during season 2007. Sample of one hundred date fruits was collected from each of the four date palm cultivars (Nabotsif, Sokary, Kalas, and Sakiey) in El-Karg at Riyadh Governorate. The tested acaricides and their application rates were as follows:

Botanical compound "Baico" 1-500 ml (Matrine 0.36%), Amitraz 20% EC (100 mill.), Vertimec 1.8% EC (40 mill.), Perpol 25% WP (25gr.) and Salocide EC 150 mill, (Methidathion 40%). Each treatment was applied with 100 Lit. Water.

The numbers of the mite, moving stages were counted after on month.

B-On Date leaflets:

The experiment was carried out during the 2007 season. Leaflet samples were randomly taken from the lower, the middle and the top levels of Nabotsif, Sokary, Kalas, and Sakiey varieties. Twenty leaflets were taken from each cultivar (5 leaflets/date palm) one time and date palm left free from any acaricide application. Samples of date leaflets were taken just before

any application of the above mentioned acaricides and after one month.

RESULTS AND DISCUSSION:

1-Occurrence and fluctuation of dust mite, *O. afrasiaticus* on fruits:

Data in table (1) and the corresponding figure 1 revealed the occurrence of *O. afrasiaticus* mite on date palm cultivars during 2007 in EL-Karg at Riyadh Governorate. Data showed that the active period of *O. afrasiaticus* mite occurred throughout the period from the first half of March until second half of October. Data revealed that the mean number of mites reached its maximum with 9095 mites/100 dates on the 26th of July. The population then decreased gradually till mid October with 124 mites/100 dates. Also the mean percentage of infestation begins after 2nd week of March reached 3%, while it was 80% on the 3rd week of October. Palevsky *et al.*, 2005 found *O. afrasiaticus* on fruit between mid-July till the end of August, when pest populations peaked.

Data obtained in the present work are wholly in agreement with those obtained by Al-Jabr *et al* 2001, who reported that, during the period from June to August, the dust mite *O. afrasiaticus* Mcg. was the most abundant mite species which infested the bunches and leaflets of the tested date palm cultivars in AL-Hassa oasis. Hussain 1969 reported that peak infestation in Iraq occurred around the middle of July.

The peaks of population of this mite depending not only on climatic conditions but also on the type of crop found as a host for the mite during a certain periods of the year and this host might be suitable for date mite in a certain stages during all its life.

Mite phonology is affected by date cultivars, but the relationship between fruit charac-

teristics and mite population development is unknown. Palevsky *et al.* (2005) found that yearly climatic variations could be responsible for phonological asynchrony between the pest and fruit development.

2-The efficiency of the botanical compound (Biaco) as compared with some chemical acaricides against *O. frasiaticus* on fruits of some date palm cultivars:

The average reductions in the dust mite numbers, during the course of the present study, are presented in (Table 2).

Data showed that all tested acaricides gave a satisfactory results after applications, regardless of date cultivars. Statistical analysis of the data revealed significant differences between botanical compound (Biaco) and the other acaricides. The mean number of dust mites on fruits reduced from about 21.90 mites in control to 5.80, 8.75, 9.25, 9.55 and 12.5 mites/100 dates in Baico, Amitraz, Vertimec, Perpol and Salocide treatment, respectively.

Take into account the acaricide types and the date cultivars, data of the reduction in the numbers of this mite species demonstrated differentiation in the acaricide potentiality according to the cultivars of date. Good results were achieved when applied all acaricides, while Biaco (1-500 ml) generally gave the best results among the compounds tested against the dust mite. The acaricide (Amitraz) accompanied by (Biaco) was ranked the first, and the accomplished average numbers were 1.60 and 5.00 mites/100 dates when applied on date cultivar of Sokary.

On the other hand, the last orders were occupied by (Salocide and Perpol) with average number ranged from (21.6) to (11.0) mites/100 dates when applied against this mite species on date cultivars of Nabotsif. Research is needed

the possibility of using other safer methods of control the pest by abotanical compound (Baico).

Regardless of the tested acaricides, the statistical analysis show significant differences among the tested date varieties, considering of reduction in number of dust mite population. These differentiations may be attributed to the morphological and physiological variation among date palm varieties, which may affect their responses to acaricide treatments for controlling the dust mite.

Anyhow, from the previously mentioned results, it can be concluded that both date cultivars and type of acaricides affected the reduction on the numbers of date mite infesting date palm. The variation of cultivars towards pest infestation may be due to antibiosis, morphological and physiological characteristics of plant, the number of, hair, and plant age (Zaren, 1987). DePew (1960) reported that Kelthane and Trihion provided high initial mortality of *O. afrasiaticus* and were superior to all other acaricides. Nettleton *et al.* (1978) found dimethoate, etluon. Perpol, dicofol and cartbophenothion most effective, among 13 tested acaricides for controlling *O. afrasiaticus*.

Elmer (1965) found that sulphur used as spray applied to date bunches. Kelthane, cartbophenothion and tetradifon gave a satisfactory control of *O. afrasiaticus* on date palm trees. Atalla and Farrag (1969) reported that kelthane 18.5% EC gave the best results among six compounds tested against the red spider mite. Al-Doghairi and Mohammed (2004) tested some acaricides in date palm plantations in Al-Gassim, Saudi Arabia, against the date mite, *O. afrasiaticus*. The overall performance of

the acaricides, determined according to their ability to reduce the mite infestations comparing with the control throughout the experiment were (96.8, 96.3, 95.2, 83.8, 81.7, 80.6, 79.0 and 30.2%) for Transact, Kelthane, Neoron, Perprol, Tedion, Microthiol, Top Cop and Ekatin, respectively.

3-The efficiency of the botanical compound (Biaco) as compared with some chemical acaricides against *O. afrasiaticus* on leaflets of some date palm cultivars:

Data (Table 3) show the reduction in average numbers of the dust mite caused by certain acaricide treatments on leaflets of four date palm varieties. According to the overall average reduction in numbers, throughout the experimental periods, results indicated that the tested acaricides ranked generally the same sequential on Nabotsif, Sokary, Kalas, and Sakiey varieties. The reductions in number of the dust mite on leaflets of botanical, (Biaco) were 17.6, 3.8, 10.6 and 12.6 dust mite/ 5 leaflets. Biaco was ranked the first one and was effective throughout the experiment, while Salocide EC (150 ml.) was exhibited less efficacy when applied against this mite species on date cultivars of Nabotsif, Sokary, Kalas and Sakiey date varieties (26.2, 14.40, 20.10 and 18.80 dust mite/ 5 leaflets) respectively Table (3).

The morphological and physiological variation among leaflets of date palm varieties may be affected their responses to acaricide treatments for controlling dust mite. Markedly differences among the tested cultivars were observed when infested with this mite.

Table (1): Mean percentage of infestation and total number of dust mite, *O. afrasiaticus* on fruits/100 dates of two date Palm cultivars (Sokary, Nabotsif) in El-Karg region at Riyadh Governorate, 2007 season

Sample Inspection date	Sokary		Nabotsif		Mean	
	Infestation (%)	Total No. mites/100 dates	Infestation (%)	Total No. mites/100 dates	Infestation (%)	Total No. mites/100 dates
Mar. 8	3	7	4	6	3.5	6.5
15	5	15	3	8	4.0	11.5
21	6	21	5	9	5.5	15.0
29	11	45	9	34	10.0	39.5
Apr. 5	10	245	13	176	11.5	210.5
12	13	272	12	210	12.5	241.0
19	17	254	19	234	18.0	244.0
26	15	378	21	160	18.0	269.0
May 3	22	490	26	365	24.0	427.5
10	19	575	24	580	21.5	577.5
17	25	466	23	890	24.0	678.0
24	32	783	31	1130	31.5	965.5
31	28	840	28	980	28.0	910.0
Jun. 7	36	1590	33	1670	34.5	1630.0
14	39	3460	38	2500	38.5	2980.0
21	42	3300	42	3740	42.0	3520.0
28	45	3520	40	3980	42.5	3750.0
Jul. 5	53	4750	45	4500	49.0	4625.0
12	48	5670	56	6795	52.0	6232.5
19	57	6200	60	6900	58.5	6550.0
26	55	8340	57	9850	56.0	9095.0
Aug. 2	46	7360	62	7790	54.0	7575.0
9	53	7690	70	8500	61.5	8095.0
16	58	8280	68	7900	63.0	8090.0
23	50	6200	79	9570	64.5	7885.0
30	59	5340	71	8450	65.0	6895.0
Sept. 6	53	3540	64	4100	58.5	3820.0
13	61	2225	70	2560	65.5	2392.5
20	69	915	79	1300	74.0	1107.5
27	73	742	74	890	73.5	816.0
Oct. 4	71	409	80	633	75.5	521.0
11	75	285	80	250	77.5	267.5
18	78	128	82	120	80.0	124.0

Table (2): Average numbers of dust mite population on different fruit date palm cultivars resulted from application of certain compounds, Riyadh region, Saudi Arabia, 2007 season

Tested compound	Variety	Avg. No. dust mite/100 fruits				Grand ⁽¹⁾ Avg. (compounds)
		Nabotsif	Sokary	Kalas	Sakiey	
Botanical acaricide (Biaco)		13.20 cdefg	1.60 M	1.40 m	7.0 ijkl	5.80 D
Vertimec 1.8 EC		11.60 defgh	5.20 Klm	14.2 cde	6.00 jkl	9.25 C
Salocide 40% EC		21.60 b	10.0 Efg hij	9.4 fghijkl	9.00 ghijkl	12.5 B
Amitraz 20% EC		9.60 fghijk	5.0 Lm	6.80 ijkl	13.6 cdef	8.75 C
Perpol 25% WP		11.00 efghi	7.4 Hijkl	10.20 efghij	9.6 fghijk	9.55 C
Control		29.60 a	15.4 Cd	26.60 a	16.0 c	21.90 A
Grand ⁽²⁾ Average (variety)		16.10 (A)	7.43 (C)	11.43 (B)	10.20 (B)	

(1&2) Means followed by the same letter, within the same column or row, and interaction individually are not significantly different at 0.05% level of probability.

Table (3): Average number of dust mite population on different leaflets date palm cultivar resulted from application of certain compounds, Riyadh region, Saudi Arabia, 2007 season

Tested compound	Variety	Avg. No. dust mite/5 leaflets/date palm				Grand ⁽¹⁾ Avg. (compounds)
		Nabotsif	Sokary	Kalas	Sakiey	
Botanical compounds (Baico)		17.60	3.80	10.6	12.60	11.15
		Efg	I	gh	fg	D
Vertimec 1.8 EC		16.8	5.80	15.60	30.60	17.20
		Efg	Hi	efg	b	BC
Salocide 40% EC		26.20	14.40	20.10	18.80	19.90
		Bc	Efg	cde	def	B
Amitraz 20% EC		17.80	14.60	16.20	26.20	18.70
		Efg	Efg	efg	bc	B
Perpol 25% WP		16.40	17.0	13.20	13.20	14.95
		Efg	Efg	efg	efg	C
Control		46.60	29.20	24.40	50.60	37.70
		A	B	bcd	a	A
Grand ⁽²⁾ Average (variety)		23.57 (A)	14.13 (C)	16.70 (B)	25.33 (A)	

(1&2) Means followed by the same letter, within the same column or row, and interaction individually are not significantly different at 0.05% level of probability.

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تواجد حلم الغبار *Oligonychus afrasiaticus* Mcg على ثمار وأوراق
بعض أنواع نخيل التمر وتقييم فاعلية المركب الحيوي بايكو
مقارنة ببعض المركبات الكيميائية الأكاروسية

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تواجد حلم الغبار على ثمار وأوراق بعض أنواع التمر بمنطقة الخرج بمدينة الرياض بالمملكة العربية السعودية حيث تمثل هذه المدينة للمنطقة كلها نظراً للتشابه في الظروف، هذا بالإضافة إلى فاعلية المركب الحيوي (بايكو) مع بعض المركبات الأكاروسية خلال موسم 2007.

أوضحت النتائج ما يلي :-

- 1- وجد أن بداية فترة النشاط لحلم التمر *Oligonychus afrasiaticus* Mcg في خلال النصف الأول من شهر مارس حتى النصف الثاني من شهر أكتوبر لنفس العام، وصل التعداد أقصاه في 26 يوليو إلى 9095.5 فرد. حيث تناقصت الأعداد تدريجياً حتى منتصف شهر أكتوبر إلى 124 فرد/100 حبة تمر.
- 2- بلغت النسبة المئوية للإصابة في الأسبوع الثاني من شهر مارس إلى حوالي 3%، ووصلت أقصاها إلى 80% في الأسبوع الثالث من شهر أكتوبر لنفس العام.
- 3- من التحاليل الإحصائية اتضح أن هناك فروق معنوية عند المعاملة بالمركب الحيوي "بايكو" بالمقارنة بالمركبات الأكاروسية الأخرى (الأميتراز، الفيرتيمك، البوبول والسلوسيد) ضد حلم الغبار، وبغض النظر عن صنف التمر فقد أعطت نتائج جيدة، وكان أفضلها المركب الحيوي البايكو.
- 4- أعطى المركب الحيوي البايكو على أوراق نخيل التمر على أصناف (نبوت سيف، سكري، خلاص، صقعي) أفضل بمعدلات خفض وهي 17.6، 3.8، 10.6، 12.6 على التوالي. بينما أعطى السلوسيد بمعدلات خفض أقل من 26.2، 14.4، 20.1، 18.8 في تلك الأصناف على التوالي.