

**FIELD EVALUATION OF CERTAIN INSECTICIDES AGAINST RED
PALMS WEEVIL *RHYNCHOPHORUS FERRUGINEUS* OLIV.
(COLEOPTERA; CURCULIONIDAE) IN EGYPT.**

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Abstract

Injection technique of infested trees was carried out, at Ismaïliya Governorate using 15 insecticides belonging to 11 chemical active ingredients. Obtained results indicated that at 10000 ppm all tested chemicals gave 100% mortality, except in Actara. At 1000ppm a reduction ranged between 80-100% , while at 100 ppm Selecron which was the most effective gave 60 % mortality , followed by Quick and Vydac. The other chemicals gave less mortality. At 10 ppm the mortality ranged between 60 – 0 % . The most effective active ingredients were chlorpyrifos (Dursban, chlorzan and pyriban) , followed by Diazenon (Basudin, and diazenox) ,phenthoat (Cidial) and methomyl (quick) .

INTRODUCTION

Red palm weevil (RPW) *Rhynchophorus ferrugineus* Oliv. had been introduced to Egypt since, 1992 (Cox,1993) . Thus, representing a key pest for the date palm. Thousands of healthy trees were lost during the last ten years. Control strategy was based on the cutting, burning and burying infested trees. Injection method (which considered the best measurements of controlling the pest) was tested by Carr(1970) using Methyl bromide to control larvae of *R. palmarum*, Mathan kurian (1971), and Abraham (1971) injected infested trees by Sevin, and mixture of BHC and Tar. Roa ,*et al* (1973), used fenthion ,carbaryl and phostoxin. During 1975, Abraham *et al*, applied dichlorvos, phosphamidon, arprocarb , trichlorophon and malathion. Cabello *et al*. (1997), used oxamyl and El-Ezaby (1997) used Marshal [carbosulfan], Primidic [pirimiphos-ethyl] and Rogodial [of unspecified composition] and obtained 98%

mortality. In 1984, many compounds were used such as monocrotophos, and Aluminium phosphide (Muthuraman,1984).

The present study aimed to evaluate some insecticides against RPW in Egypt. Through the Red Palm Weevil Regional Project, funded by Novartis and in collaboration with Peres Center for Peace it was planned to assess some experiments in order to evaluate some effective compounds acting well in controlling progress.

MATERIALS AND METHODS

Field trials were carried out during June 2000 to January 2002 at Ismailia Governorate (120 Km East of Cairo) which reported as heavily infested area together with Sharkia Governorate in Egypt since 1993. Fifteen different commonly used insecticides belonging to different groups were tested, five serial concentrations for each insecticide 1, 10, 100, 1000 and 10000 ppm. , were prepared.

Chemical compounds:

- 1- Actara 24% SC (thiamethoxam) as a systemic group.
- 2- Vertemic 1.8% EC (Abamectin) as a bio-agent group .
- 3- Proclaim 5% EC (emamectin benzoate) as a Synthetic bio-agent group
- 4- Match 5% EC , (lufenuron) as IGR group .
- 5- Selecron 72% EC (profenfos) as OP group .
- 6- Cord 72% EC (profenfos) as OP group .
- 7- Curacron 72% EC (profenfos) as OP group .
- 8- Cidial 50% EC (phenthoate) as a OP group .
- 9- Basudin 60% EC (Diazenon) as a OP group .
- 10- Diazenox 60% EC (Diazenon) as a OP group.
- 11- Dursban 48% EC (Chlorpyrifos) as a OP group .
- 12 - Chlorozan 48% EC (Chlorpyrifos) as OP group .
- 13- Pyripan 48% EC (Chlorpyrifos) as a OP group .
- 14- Quick 90% SP.(Methomyl) as a carbamate group.
- 15- Vydate 24% SL,(oxamyl,carbamate) as a carbamate group.

Method of application:

Current experiments were carried out using injection technique which appears as the most promising to apply the chemicals against the internal stages of the pest inhabiting the tree.

Different degrees of visible symptoms of infested trees were chosen. Ten to Fifteen centimeters up to the infestation position, a hole (1cm in diameter) was made and reaching the inner soft tissues by a nail or drill machine. A plastic tube was inserted into the hole to keep it open for the solution. Holes were arranged around position of infestation (4-10 holes). Tested concentrations were poured into the plastic tubes (may use sprayer at its normal pressure). Tested solutions should pour into the position till the inside cavity made by larval stages had already filled.

After 7 days of treatment, trees were inspected for recovery indicated by disappearing of infestation symptoms (no oozing).

Ten marked trees were sampled for each tested concentration.

RESULTS AND DISCUSSION

The careful integration of the data in Table (1), and Fig.(1), show the fluctuations in the tested trees recovery figures from RPW infestation due to injection treatment with tested chemicals in Egypt.

For 10000 ppm all tested chemicals showed 100% mortality figure except Actara compound (60%). At 1000 ppm , Curacron, Dursban, Chlorzan, Pyriban, Cidial, Basudin, Diazenox, and Quick gave 100% mortality figures, while Selecron gave 90% and each of Vertemic, Match, and Cord, gave 80%. Proclaim , however , gave 70% and Actara ,40%. For 100 ppm , Curacron was the most effective , Dursban and Cidial which gave 80% mortality , while other chemicals were ranged between 10-70% mortality figures. The highest percentages of mortality at 10 ppm were fluctuated from 60%

Table 1 . Effect of different insecticides against RPW individuals (Remedial effect)
by injection method.

Isecticides	Active ingredient	Concentration		% Recovery in 7 days
		In ml/liter	In ppm	
Actara 24% SC	Thiamethoxam	42.0	10000	60
		4.2	1000	40
		0.42	100	30
		0.042	10	10
		0.004	1	0
Vertemic 1.8% EC	Abamactin	555.05	10000	100
		55.51	1000	80
		5.5	100	60
		0.56	10	30
		0.06	1	0
Procalim 5% EC	Emamactin	200	10000	100
		20.0	1000	70
		2.0	100	10
		0.2	10	0
		0.02	1	0
Match 5% EC	Lufenuron	20.0	10000	100
		2.0	1000	80
		0.2	100	40
		0.02	10	0
		0.002	1	0
Selecron 72% EC	Profenfos	13.89	10000	100
		1.39	1000	90
		0.139	100	60
		0.014	10	20
		0.001	1	0
Cord 72% EC	Profenfos	13.89	10000	100
		1.39	1000	80
		0.139	100	60
		0.014	10	50
		0.001	1	0
Curacron 72% EC	Profenfos	13.89	10000	100
		1.39	1000	100
		0.139	100	80
		0.014	10	60
		0.001	1	0
Dursban 48% EC	Chlorpyrifos	20.83	10000	100
		2.08	1000	100
		0.21	100	80
		0.02	10	50
		0.002	1	0
Chlorzan 48% EC	Chlorpyrifos	20.83	10000	100
		2.08	1000	100
		0.21	100	60

		0.02	10	40
		0.002	1	0
Pyriban 48% EC	Chlorpyrifos	20.83	10000	100
		2.08	1000	100
		0.21	100	70
		0.02	10	50
		0.002	1	0
Cidial 50% EC	Phenthoate	20.0	10000	100
		2.0	1000	100
		0.2	100	80
		0.02	10	60
		0.002	1	0
Basudin 60% EC	Diazenon	16.66	10000	100
		1.67	1000	100
		0.167	100	60
		0.017	10	30
		0.002	1	0
Diazenox 60% EC	Diazenon	16.66	10000	100
		1.67	1000	100
		0.167	100	70
		0.017	10	40
		0.002	1	0
Quick 90% SP	Methomyl	11.11	10000	100
		1.11	1000	100
		0.11	100	60
		0.01	10	0
		0.001	1	0
Vydate 24% SL	Oxamyl	41.66	10000	100
		4.17	1000	80
		0.417	100	40
		0.042	10	10
		0.004	1	0

(Cidial and Curacron) to 0% in the rest of tested chemicals .Eventually, mortality at 1 ppm did not demonstrate any response.

When the toxic active ingredient was considered it appears that Chlorpyrifos was the most effective group, followed by phenthoate, Diazenon, and Methomyl profenfos Match acts as IGR group which give its efficacy by certain way and has no initial reliable effect. Actara, which considered as neonicotinoides group gave systemic effect.

In general, the key factor of injection method depends on the experience of the involved person who apply the control measurements more than the efficiency of the chemical itself.

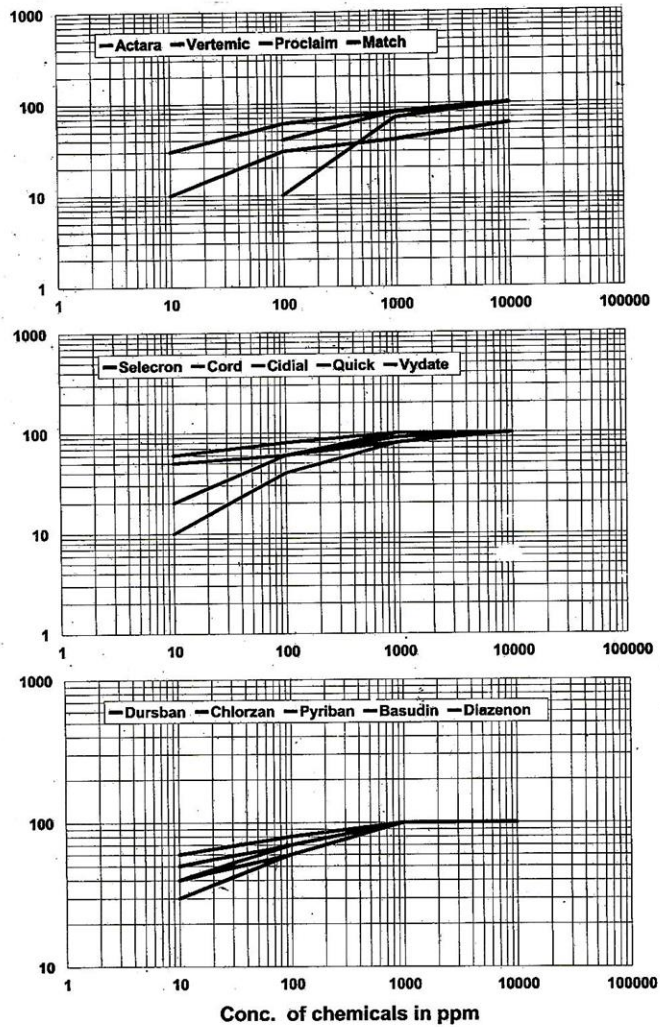


Fig.1. Effect of different applied chemicals on the mortality of RPW larvae inside palm trees at Ismailia Governorate during 2000-2002.

REFERENCES

1. Abraham, V.A., K.M.A. Koya, and C. Kurian .1975.: Evaluation of seven insecticides for control of the red palm weevil, *Rhynchophorus ferrugineus* F. Journal of Plantation Crops, 3 (2): 71-72.
2. Abraham,V.A. 1971. Prevention of red palm weevil entry into coconut palms through wounds. Mysore Journal of Agricultural Sciences , 5 (1): 121-122 .
3. Carr,T.W.A. 1970 : Methyl bromide fumigation of red ring diseased coconut trees. I. Preliminary tests for nematocidal and insecticidal effect., Journal of the Agricultural Society of Trinidad and Tobago. , 70: 431-438 .
4. Cox, M.L. 1993 : Red palm weevil, *Rhynchophorus ferrugineus*, in Egypt. FAO Plant Protection Bulletin , 41: 30-31.
5. Cabello, T., J. Pena, P. Barranco and J. Belda . 1997. Laboratory evaluation of imidacloprid and oxamyl against *Rhynchophorus ferrugineus*. Tests agrochem cultiv. London : Association of Applied Biologists, (18) : 6-7.
6. El-Ezaby, F.A. 1997. Injection as a method to control the red indian date palm weevil, *Rhynchophorus ferrugineus*. Arab Journal of Plant Protection ,15: 31-38.
7. Mathen, K. and C. Kurian . 1971 . Sevin controls red palm weevil at low cost. Coconut Bulletin ,1 (5) : 7-8.
8. Muthuraman, M. 1984 . Trunk injection of undiluted insecticides – a method to control coconut red palm weevil, *Rhynchophorus ferrugineus* Fab. Indian Coconut Journal, 15 (2): 12-14.
9. Rao P.V.S., T.R. Subramaniam and E.V. Abraham . 1973 . Control of the red palm weevil on coconut. Journal of Plantation Crops, 1(1-2) : 26-27.

التقييم الحقلى لبعض المبيدات ضد سوسة النخيل الحمراء فى مصر

يسرى السباعى

معهد بحوث وقاية النباتات ، مركز البحوث الزراعية ، الجيزة ، النقى ، مصر

لجريت التجارب الحقلية لتقييم ١٥ مبيد تنتمى الى ١١ مجموعة فعالة بمنطقة الاسماعيلية بطريقة الحقن الموضعى للشجار المصابة بسوسة النخيل الحمراء . وقد اوضحت النتائج ان تطبيق المركبات بجرعة ١٠,٠٠٠ جزء فى المليون اعطت كلها ١٠٠% موت لجميع الاطوار داخل النخل المصاب عدا مركب اكتارا ، لما جرعة ١٠٠٠ جزء فى المليون فقد تراوحت نسبة الموت من ٨٠-١٠٠% وبأستخدام جرعة ١٠٠ جزء فى المليون اعطى ٦٠% (السليكرون ، كويك) ، فايديت وباقى المركبات اعطت نسب اقل . بينما بأستخدام جرعة ١٠ جزء فى المليون تراوحت نسب الموت بين صفر- ٦٠%. كانت افضل المواد الفعالة هى مجموعة الكلوبيروفوس - الفينثويت - الدياتينون - ثم الميثوميل .