

# **CONTROL OF RED PALM WEEVIL, *RHYNCHOPHORUS FERRUGINEUS* OLIVER USING PROPHYLACTIC SPRAYING OF DATE PALMS AND TRUNK INJECTION**

**K. M. Azam, and S. A. Razvi**

Department of Crop Sciences, College of Agriculture, Sultan Qaboos  
University,

P.O. Box 34, Al-Khod 123, Sultanate of Oman

## **ABSTRACT**

Efficacy of five insecticides, viz., Trichlorphon 80 SP, Aflix (endosulfan + dimethoate) 38.5 EC, dimethoate 40 EC, Marshal (Carbosulfan) 25 EC and Nogos (dichlorvos) 50 EC and was evaluated by spraying the date palms at 0.1% concentration as prophylactic sprays for the control of red palm weevil. All the palms sprayed with dimethoate and Nogos were free of infestation for a four months period post-treatment. The infestation was low (4%) in Aflix and Marshal, as compared to control with 12%.

Efficacy of 12 insecticides injected either alone or mixed with water in infested palms revealed that palms injected with (Aflix, or ISH, or Annona or Anthio, diluted in water at ratio of 1:1) (dimethoate dime water at ratio of 1:2 and (IKC water at ratio of 1:3.5 v/v) completely recovered. The treatments with Sunny Neem oil and Fenitrothion had poor efficacy of 42-57%.

## **INTRODUCTION**

Control practices using chemicals is one of the quick solves of pest problem. Although pesticides have ahazardous effect on environment and side effects on the consumers of crops its application in some caals is a must. Out break of pest population, scar city of biological agents, the quick deterioration of trees and the economical factors give a power view to apply pesticides in very limited extremes. The objective of the present work is to add some new contributions to our available knowledge on the control of the RPW using.

## MATERIALS AND METHODS

### 1. Prophylactic Spraying of Date palms

Field experiments were conducted to evaluate the efficacy of five insecticides viz., Trichlorphon 80 SP, Aflix (endosulfan + dimethoate) 38.5 EC, dimethoate 40 EC, Marshal (carbosulfan) 25 EC and Nogos (dichlorvos) 50 EC at 0.1% concentration, sprayed as prophylactic measure against RPW (Table 1).

Healthy and young date palms of age 6-10 years were selected in highly infested farms in Saara. From the selected palm trees, old leaves and offshoots coming out from the trunk were cut, creating wound on the trunk and which was thoroughly treated using high volume air compressor sprayer with the respective insecticide. There were six treatments including one untreated control. Each treatment was replicated five times. The experiment was repeated five times at two weeks interval as set 1 to 5. The treated and control plants were observed for a period of four months post-treatment.

### 2. Evaluation of certain insecticide selected for the control of red palm weevil through trunk injection

Field experiments were conducted to test the efficacy of certain insecticides tended to be used as for control of RPW. The tested insecticides were: Nogos 50 EC (dichlorvos), Dimethoate 40 EC, and Aflix (endosulfan 24% + dimethoate 14.5%) 38.5 EC, as such and in dilution with water in the ratio of 1:1 and 1:2 v/v; Totalene (mixture of trichlorphon 30% + dimethoate 10% + fenitrothion 5%) and Fenitrothion as such; Marshal (carbosulfan) 25 EC and Sunny Neem Oil 1500 EC (Azadirachtin 0.15%) as such and in dilution with water in the ratio of 1:1 ISH: water while IKC + water (1:3.5 v/v) and Anthio + water in ratio of 1:1 and 1:2 v/v (Table 2).

The seed extracts of *Annona squamosa* and Neem (*Azadirachta indica*) were prepared by steeping 12.5 gm shade dried seed powder of the plants in 62.5 ml of water ethanol (1:4 v/v) for 24 hours. It was then suction filtered. The filtrate was diluted with water in the ratio of 1:1 (v/v) just before injection.

Newly infested palms where brown fluid is oozing out from the trunk were treated by injecting insecticides alone or mixed with water in the

desired ratio. The infested portion of the trunk was superficially chiseled to remove some of the eaten portion and also any larvae and or pupae present inside. Three holes of 12-15 cm deep and 1.5 cm diameter were then made slanting down at 45° angle towards the wound with the help of an auger from three sides of the infested portion. Chiseling out of tissues and hammering with thick iron rod into the trunk to make hole was very cumbersome, which was replaced by electrically operated drill machine to make hole into the trunk to inject insecticide. In each hole 10 ml of the tested insecticide or its solution in water was injected. The holes were plugged with cotton. The wounded portions of the trunk was covered with mud to prevent from any new infestation. The plants were observed for six weeks for any oozing taking place. Oozing stop was taken as an indication the effectiveness of the chemical for the control of RPW.

## **RESULTS AND DISCUSSION**

### **Insecticide spray as prophylactic measure:**

Review of literature suggests that it is necessary to protect young palms from all possible mechanical injury so that the ideal sites for oviposition are not available to the weevil. However, wounds are created on the palms by cutting the old leaves and by removing the offshoots coming out from the trunk. According to Abraham et al (1998) soaking of palms with insecticides with a special soaking lance is an effective preventive measure. The insecticide solution that runs of the trunk forms a thin film and reaches cracks and crevices and cut surfaces, making these sites unsuitable for egg laying. Apart from preventing pest entry, soaking also gives an additional curative benefit as percolation of the chemical can also destroy different insect stages, if present in the cracks, crevices, leaf axils and cavities of palms. Mathen and Kurian (1966) recommended filling leaf axils of young coconut palms with 5 percent BHC/chlordane along with sand. However, in date palm, dusting the whole palm with insecticide has distinct disadvantages.

In the present study observations recorded after four months of spraying (Table 1) revealed that all the plants sprayed with dimethoate and dichlorvos were free from infestation in all the sets. The infestation was low (4.0%) in Aflix and Marshal. Trichlorphon was least effective recording 8.0% infestation compared with 12.0% in control treatment.

## Trunk Injection

In the present study, all the RPW infested date palms treated with Aflix, ISH, Annona and Anthio diluted in water at ratio of 1:1; dimethoate water in the ratio 1:2 and IKC + water (1:3.5 v/v), oozing stopped completely (Table 2). The other effective treatments were Nogos, dimethoate, Totalene, Aflix, dimethoate + water (1:1), Nogos + water (1:1) and (1:2), Neem + water (1:1 v/v) and Aflix + water (1:2) with stoppage of oozing by 78.95, 90.00, 85.71, 88.89, 85.71, 77.78, 75.00, 71.43 and 80.00% respectively. Marshal tested alone or diluted with water at ratio of 1:1 gave 60.00% recovery. The recovery was poor in Sunny Neem oil applied alone or combined with water of ratio of 1:1 and alone in Fenitrothion treatment being 42.86, 54.54 and 57.14% respectively.

Nirula (1956) recommended the administration of the insecticide pyrethirins + the synergistic piperonyl butoxide, into the affected part of the stem using a funnel. Mathen and Kurian (1967) and Abraham and Kurian (1975) recommended the use of carbaryl and trichlorphon respectively. Slanting holes, 5 cm in diameter and 15 cm deep, were made around the affected part using a hollow pointed iron pipe. Then the insecticide solution was poured into these holes, which kills different stages of the pest if present. The number of holes varied according to the infested area on the palm. Abraham et al (1998) also suggested fumigating the infested palms with aluminum phosphate tablets by putting in the tunnels and plugging all outlets on the palms.

## REFERENCES

- Abraham, N. A. and C. Kurian. 1975. An integrated approach to the control of *Rhynchophorus ferrugineus*, the red palm weevil of coconut palm. 4<sup>th</sup> session of the FAO Technical working party on coconut production, protection and processing. Kingston, Jamaica, Sept. 1975.
- Abraham V. A., M. A. Al-Shuaibi, J. R. Falerio, R. A. Abozuhairah and P. S. P. Vidyasagar. 1998. An integrated management approach for Red palm weevil, *Rhynchophorus ferrugineus* Oliv. a key pest of date palm in the Middle East. SQU Journal of Scientific Research - Agricultural Sciences, Vol.3, 77-83.

- Mathen, K and C. Kurian. 1966. Prophylactic control of *Rhynchophorus ferrugineus*. Indian J. of Agric. Sci. 36: 285-286.
- Mathen, K and C. Kurian. 1967. Insecticidal trials against *Rhynchophorus ferrugineus*, the coconut weevil. Indian Journal of Agric. Science, 37: 231-235.
- Nirula, K. K. 1956. Investigations on the pests of coconut palm. Part IV, *Rhynchophorus ferrugineus*. Indian Coconut Journal, 10: 38-44.

Table 1. Efficacy of certain insecticides sprayed as prophylactic measure against red palm weevil.

S. No.	Treatment	% Concentration	No. of palms infested by RPW in subsequent dates after spray					Total No. of palms treated in the five sets	No. of palms infested	Infestation %
			I 24.1.99	II 7.2.99	III 21.2.99	IV 7.3.99	V 21.3.99			
1	Trichlorphon 80 SP	0.1	1 (21.2.99)	1 (16.5.99)	0	0	0	25	2	8.00
2	Aflix 38.5 EC	0.1	0	1 (16.5.99)	0	0	0	25	1	4.00
3	Dimethoate 40 EC	0.1	0	0	0	0	0	25	0	0.00
4	Marshal 25 EC	0.1	1 (21.2.99)	0	0	0	0	25	1	4.00
5	Nogos 50 EC	0.1	0	0	0	0	0	25	0	0.00
6	Control	---	1 (21.2.99)	1 (2.5.99)	1 (16.5.99)	0	0	25	3	12.00
TOTAL			3	3	1	0	0	150	7	4.67

Under each treatment there are five plants which form the replicate.

Figures in the parentheses are the dates on which infestation was observed.

Table 2. Efficacy of certain insecticides given as trunk injection for the control of Red palm weevil

S. No.	Insecticide	Dosage per plant	No. of plants injected	No. of plants recovered	Recovery %
1	Nogos 50 EC	10 ml x 3	19	15	78.95
2	Dimethoate 40 EC	10 ml x 3	10	9	90.00
3	Totalene 45 EC	10 ml x 3	14	12	85.71
4	Sunny Neem Oil 1500 EC	10 ml x 3	21	9	42.86
5	Aflix 38.5 EC	10 ml x 3	18	16	88.89
6	Dimethoate + water 1:1 v/v	10 ml x 3	14	12	85.71
7	Sunny Neem Oil + Water 1:1 v/v	10 ml x 3	11	6	54.54
8	Nogos + Water 1:1 v/v	10 ml x 3	18	14	77.78
9	Fenitrothion 50 EC	10 ml x 3	7	4	57.14
10	Aflix + Water 1:1 v/v	10 ml x 3	7	7	100.00
11	Marshal 25 EC	10 ml x 3	10	6	60.00
12	Marshal + Water 1:1 v/v	10 ml x 3	10	6	60.00
13	Nogos + Water 1:2 v/v	10 ml x 3	8	6	75.00
14	ISH + Water 1:1 v/v	10 ml x 3	6	6	100.00
15	IKC+ Water 1:3.5 v/v	10 ml x 3	6	6	100.00
16	Annona + Water 1:1 v/v	10 ml x 3	14	14	100.00
17	Neem + Water 1:1 v/v	10 ml x 3	14	10	71.43
18	Dimethoate + Water 1:2 v/v	10 ml x 3	10	10	100.00
19	Aflix + Water 1:2v/v	10 ml x 3	10	8	80.00
20	Anthio + Water 1:1 v/v	10 ml x 3	10	10	100.00
21	Anthio + Water 1:2 v/v	10 ml x 3	10	7	70.00