

## FIELD STUDIES ON THE CONTROL OF SUBTERRANEAN TERMITE *Amitermes desertorum* (DESNEUX) (ISOP.TERMITIDAE) ATTACKING DATE PALM TREES IN ASWAN GOVERNORATE

H. M. Ahmed <sup>(1)</sup> and K.M. Mohany <sup>(2)</sup>.

(<sup>1</sup>) Plant Protect. Res. Inst., Dokki, Giza

(<sup>2</sup>) Fac. of Agric., Quna South Valley Univ.

---

**Abstract:** In the present work, four insecticides were used against subterranean termites attacking date palm trees in Abu-El-Rich region at Aswan Governorate throughout three successive years 2004- 2007. The obtained results showed that, all effective method of control is by making a ditch 30 cm width X 30cm depth surrounding the tree and 50cm far from the trunk. Each one longitudinal meter required 4 liters of insecticides solution. Four corrugated board traps were used each tree as a bait traps. All replicates of corrugated board traps were infested by the subterranean

termite *A. desertorum* within the date palm trees before treatment with insecticides. Infestation was distributed by subterranean termite *A. desertorum*, where it attack most of date palm trees under experiment and ranged from 75-95%. Results revealed that, the use of Dursban Tc at (2% &3%) , Byreban at (2% &3%) and Chlorozan at (2% &3%) at the rate of (4 liters) solution per one longitudinal meter could give economically significant control against subterranean termite *A. desertorum* attacked the date Palm plantations.

---

**Key words:** Control, Subterranean termite, Insecticides, Concentrations Date Palm trees, *Amitermes desertorum* .

### Introduction

Date Palm provide a primary article of foods and commercial crop in many subtropical desert regions. Subterranean termites are ground dwelling social insects, the mature colony

consisting of three castes that living in large colonies, as follows: Workers, Soldiers, and reproductives castes (King and Queen). Although the colonies were found in soil, subterranean termites can attack wood trees,

Palm trunks, and olive trees (El-Haemesy1976) and some field crops in mature such as sugar can, cotton, peanut and wheat plants (AL-Kady & Fragalla 1986) above the ground, where, its reach the cellulose materials in alive trees by constricting and traveling throughout mud tunnels that connect their colony to cellulose in alive trees, date palm trees (Badawy *et al*, 1986 and Helal & El-Sebay, 1994), Subterranean termites *Amitermes desertorum* (Desneux) is the most distributed subterranean termites in south Egypt. This species attack date palm trees and wood trees in Aswan Governorate (Helal & El Sebay1994)and other cellulose products resulting sever damage on the national income. Few studies of control had been carried out in Egypt, (El-Sebay 1993 and Ahmed 2003).So, the present work aimed to study the control of subterranean termite *Amitermes desertorum* attacking date palm trees by using insecticides under field conditions.

### Material and Methods

Experiments were conducted for three successive seasons(2004-2007) in Abu El-Rich region, Aswan Governorate, which is famous in date palm trees cultivations and considering the main source of its national income, Also, subterranean termites *A. desertorum* attack

date palm trees (*Phoenix dactylifera* L.) causing severe damage either to the trees or in directly to the fruits.

### Insecticides and concentrations

Five insecticides were applied as follows:1-Dursban<sup>®</sup> Tc (Chloropyrifos), (O.O- diethyl O-(3, 5, 6-trichloro-2-Pyridyl) phosphorothioate 2- Byreban<sup>®</sup> (Chloropyrifos ), (O.O- diethyl O-(3, 5, 6-trichloro-2-Pyridyl) phosphorothioate 3- Termidor<sup>®</sup> (Fibronil) (5- amino- [2,6-dichloro-5- amino - [2,6-dichloro - $\alpha$ - $\alpha$ - (trifluoromethyl) phenyl - 4 - (trifluoromethyl) sulfinyl] - 1 H- Pyrazole - 3- carbonitrile. 4- Sumithion<sup>®</sup> (Fenitrothion -O P group) O. O-(3- methyl-4-nitrophenyl) phosphorothioate. 5-Chlorozan<sup>®</sup> (Chloropyrifos), (O. O- diethyl O- (3,5,6-trichloro- 2-pyridyl) phosphorothioate.

### Method of applications

Each chemical has two concentrations (2% and 3%) and five replicates (5 Palm trees) for each one. Infested date palm trees were chosen by placing the corrugated card board rolls which served as abait traps (El- Sebay 1991) and have strong attractiveness more than any cellulose material (Ahmed 2003). Four traps were buried randomly under each tree for one month to estimate the rate of infestation before treatment. Traps were collected after one month and determination of infestations had

been carried out as control before treatment applied. A shallow ditch measured 30cm depth and 30cm width and 50cm far from the trunk was made around each tree. Each ditch was treated with chemical concentrations (2% and 3%) at the rate 4 liters of solution per one longitudinal meter, hence, soil returned back after treatment and a new four corrugated board traps were buried at 15 cm far from the tree trunk and inside the 50cm zone. Application was conducted on March 2004 and inspections were made up six months interval (early Sept. and early March every year). Corrugated board traps were picked up renewed before one month of inspection, transferred to the laboratory for infestation examination.

### **Results and Discussin**

Data in table (1) showed that, the percent of infested traps before treatment of experiment with insecticides. All replicates of corrugated board traps were infested by the subterranean termite *A. desertorum* within the date palm trees before treatment with insecticides. Infestation was distributed by subterranean termite *A. desertorum*, where it attack most of date palm trees under experiment and ranged from 75-95%.

Data in table (2) showed that, there were no infestation in the corrugated board traps around the treated Palm trees throughout the

1<sup>st</sup> inspection (Sept.2004) for all insecticides. In 2<sup>nd</sup> inspection( March 2005) it was found that, the percent of infestation reached to 15% in Termidor treatment at 2%, followed by 3% which gave 5% infestation. The same insecticide gave (25% and 15%) infestation at (2% and 3%) in the 3<sup>rd</sup> inspection, (Sept.2005) while, the insecticide Chlorozan gave 5% infestation at 2% and Sumicidin gave 10% infestation at 2% during this inspection. During the 4<sup>th</sup> inspection, (March 2006) the highest infestation percent 30% was obtained from Termidor2%, while the lowest one was 5% in Byreban 2 %. In 5<sup>th</sup> inspection, the percent of infestation was fluctuated from highest one in Termidor 2% &3% (40% & 35%), and Sumicidin 2% (25%). Throughout 6<sup>th</sup> inspection, the highest infestation percent was (55% and 40%) occurred in Termidor 2% and 3%, while the lowest one was 10% in Byreban 3%.

From the above mentioned results, it could be stated that, the use of Dursban Tc at (2% and 3%) , Byreban at (2% and 3%) and Chlorozan at (2% and 3%) at the rate of (4 liters) solution per one longitudinal meter could give economically significant control against subterranean termite *A. desertorum* in date Palm plantations.



El-Sebay (1993) showed the direct effect of different insecticides and termites ability to constrict tunnels through treated soil. He found that Dursban, Osbac and Sumithion were the most effective chemicals against subterranean termites either directly or in preventing tunneling constriction on at less than 100 ppm. Borax and Crezodial showed less effects. Helal and Sebay (1994) found that, the use of Dursban 4 TC at 2% or Cidial L50 at 3% could give economically significant control against two subterranean termites. Badawi *et al*, (1986) revealed that, out of 9 chemicals used as soil

insecticides for the control of subterranean termites attacking alive plants in Saudi Arabia, Scidco PLS 1:10, Dursban TC 42%EC, Dieldrin 20%EC and Chlorodan 72%EC2% proved to be the most effective. The percentages of termites damaged plants recorded were 6.2, 7.1, 7.8 and 9.1 for the preceding chemicals respectively. Also, Ahmed, (2003) concluded that, any termiticide proved to be more effective and moved vertically to a lesser extent can be used for subterranean termite control but the termiticide which moved vertically to greater depth must be neglected.

**Table(2):** Effect of certain insecticides on subterranean termite *Amitermes desertorum* (Desneux) indicated by number of infested corrugated board traps during three successive years.

Insecticides	Conc. %	Percent of infested traps per replicates (Palm tree)					
		Period of inspections					
		Sept. 2004	March 2005	Sept. 2005	March 2006	Sept. 2006	March 2007
DursbanTc	2%	0.0 %	0.0%	0.0%	0.0%	10%	20%
	3%	0.0 %	0.0%	0.0%	0.0%	5%	15%
Byreban	2%	0.0 %	0.0%	0.0%	5%	15%	20%
	3%	0.0 %	0.0%	0.0%	0.0%	5%	10%
Chlorozan	2%	0.0 %	0.0%	5%	10 %	15%	20%
	3%	0.0 %	0.0%	0.0 %	0.0 %	10%	15%
Termidor	2%	0.0 %	15%	25%	30 %	40%	55%
	3%	0.0 %	5%	15%	25 %	35%	40%
Sumicidin	2%	0.0 %	0.0%	10 %	20 %	25%	30%
	3%	0.0 %	0.0%	0.0%	10%	15%	25 %

**Referances**

AL-Kady, B.A.H. and A.A. Fragalla. 1986. Termites of Saudi Arabia their hosts and geographical distribution

Z.Ang. Entomol., 101(4): 413-420.

Ahmed, H.M. 2003. Ecological and control studies on subterranean termites under Fayoum conditions. PhD thesis Fac Of

- Agric Fayoum, Cairo University. Plant Protect. Cario.1-5 Dec., 1991.245-246.
- Badawi, A., A.A. Faragalla and A. Dabbour 1986.Studies on termites problem in Saudi Arabia, Scientific Research Division, King Abdel Aziz Univ. Saudi Arabia,.5: 99-105.
- EL-Hemaesy, A. H. 1976. A short not on the desert subterranean termites *Amitermes desertorum* (Desneux) attacking olive trees in upper Egypt. Agric. Res. Min. of Agric. Egypt (54): 193-195.
- EL-Sebay,Y.1991. A modified EL-Sebay trap for subterranean termites 4<sup>th</sup> Arab Congress of
- EL-Sebay,Y.1993.Evaluation of soil treatment with certain insecticides for subterranean termite control. Bull. Ent. Soc. Egypt. Econ. Ser.20: 47-58.
- Helal, T.Y.and Ali, A. Maher 1982. Laboratory evaluation of toxicity of insecticides to the egyption termites. Assuit J. Agric. Sci.13 (3) 189-201.
- Helal, H. and Y. El-Sebay 1994. Contribution on the wood borers attacking date palm trees and its control in Egypt . Egypt J.Hort.21(1): 25-46.

## دراسات حقلية على مكافحة النمل الأبيض التحت أرضي *Amitermes desertorum* (Desneux) الذي يصيب نخيل البلح بمحافظة أسوان

حسن محمد أحمد على (١) و كارم محمد مهني (٢)

(١) معهد بحوث وقاية النباتات - الدقى - الجيزة

(٢) كلية الزراعة بقنا - جامعة جنوب الوادى

فى هذا العمل إستخدمت اربعة مبيدات تجاه النمل الابيض التحت أرضى *Amitermes desertorum* الذى يصيب نخيل البلح بمنطقة ابو الريش فى اسوان خلال ثلاث أعوام متتاليه ٢٠٠٤-٢٠٠٧ م.ومن النتائج المتحصل عليها اتضح ان معظم الطرق المؤثرة فى المكافحة كانت بواسطة عمل خندق فى التربه ٣٠سم عرض X ٣٠سم عمق ويبعد ٥٠سم من الجذع وقد عومل كل متر طولى بأربعة لتر من محلول المبيد وإستخدمت اربعة مصائد كرتونيه لكل شجره نخيل كقطع جاذب لحشرات النمل الأبيض التحت أرضى. وإتضح ايضا" ان كل المكررات للمصائد المستخدمه قبل إجراء المعامله أصيبت بالنمل الابيض داخل أشجار نخيل البلح وتتوعت درجة الاصابه داخل التجربه حيث تراوحت ما بين ٧٥-٩٥% وأظهرت النتائج ان الدورسبان TC والبيربان والكلوروزان كل منهم بتركيز ٣:٢% و بمعدل ٤ لتر محلول لكل متر طولى أعطى تأثير معنوى فى المكافحة تجاه النمل الابيض التحت أرضى فى مزارع النخيل .