

HISTORICAL RECORDS OF APPLICATION OF THE MINISTERIAL LAW 1205/1996 TO MOVE FROM CONVENTIONAL INSECTICIDES TO SAFE BIO-PRODUCTS TO COMBATE *BATRACHEDRA AMYDRAULA*, *VIRACHOLA LIVIA* AND *CADRA* SPP IN NEW VALLY GOVERNORATES

TEMERAK, S. A.¹ AND A. A. SAYED²

^{1.} Plant Protection Department, Faculty of Agriculture, Assiut University

^{2.} Plant Protection Research Institute, ARC, Giza

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Abstract

In Egypt, The first use of alternation of different class of safe chemicals on dates to combat the lesser date moth *Batrachedra amydraula*, *Viracola livia*, and the almond moth *Cadra* spp was adopted by temerak and sayed in 2004 in Egypt(Temerak and sayed & sayed and temerak 2007) *B. amydraula*.

Based on minimum effective rotation doses, alternate Tracer 24SC at 20 ml/100L then Runner 24SC at 15 ml/100L with 2-week interval showed zero infestation and 1.8% at the last sample of 2004 and 2005, respectively.

V. livia

Based on minimum effective rotation doses, alternate Tracer 24SC at 20ml/100L then Runner 24SC at 15ml/100L with 3-week interval showed 0.3 and 0.6% infestation, before harvest for 2004 and 2005, respectively. However, before harvest, untreated infestation was 33 and 70% in 2004 and 2005, respectively. Also, Successful penetration % of alive larvae into the fruit by using the minimum effective doses of rotation program resulted in almost 1.8, and 1% larvae, before harvest in 2004 and 2005, respectively. However, it reached to 97% and 89% in the untreated in 2004 and 2005, respectively. The last reflect the excellent effect on the neonate larvae. During the same period, reduction of the 3 rotation programs was 97.8-99 and 99-100% for 2004 and 2005, respectively.

***Cadra* spp**

Based on infestation of the late insect pest *Cadra* spp, same previous trend of the 3- rotation results. Based on minimum effective rotation doses, alternate Tracer 24SC at 20 ml/100L then Runner 24SC at 15 ml/100L with 3-week interval indicated less than 1% and 1% infestation during harvest for 2004 and 2005, respectively. The last reflected important value when storing the fruit. Both products proved to be working under dry hot high temperatures. Both products proved to be working under dry hot temperatures

INTRODUCTION

Date palm is considered one of the most important cash crops in the New Valley Governorate. In this Governorate more than one million date palm trees are grown . Besides the local consumption, dates are also exported to foreign countries. Worldwide, Egypt is considered number 1 as production / unit tree.

The lesser date moth *Batrachedra amydraula* Meyrick is the most serious early pest on date fruit in the Oases of the New Valley (Saleh, 1974 , Badawi et al., 1977). It also considered as key insect pest in the surrounding countries eg Israel, Iraq ,Iran ,Yamen Lybia , Saudi-Arabia and Emirates.The loss due to this pest only could reach to more than 30 % of the final yield.

The larvae attacks young date fruits and usually stop growing. Larvae of this pest were observed to feed on the flesh along the stone in May and June, causing most of the fruit to become red-brown and finally drop (Venezian and Blumberg, 1982, Badawi et al., 1977. Venezian and Blumberg, 1982 observed that considerable fruit drop of dates by *B. amydraula*, mainly between April and June in Egypt and Israel, respectively. Saleh ,1974 stated that infestation with *B. amydraula* from the first of July onwards, decreased fairly and by the end of August in New Vally ,Egypt

During pre-harvest period,the pomegranate butter fly *Virachola livia* is serious pest attacking dates. It is greatly affected the exportation value .

Cadra spp (*C.cautella* and *C.calidella*) are the most late important insect pests that start in the field and continue in storehouses(Sayed and El-Deeb, 1996) They indicated that sex pheromones played a significant role inside storehouse and not in the field.

Al Jabar 2003 stated that *Ephestia kuehniella* Zell is the most important pest arriving at Al Hassa factory from the field. Essa,2003 reported that satisfactory control was achieved by covering date bunches during the 1st half of July.

In Egypt , to control date pests, several control methods have been used i. e. conventional insecticides (Abd El-Rahim et al., 1974, Sayed and Aly 1995), sex pheromone (Sayed, 2000), Mechanical (Sayed and Temerak,1995), biocide (Sayed and Ali,1995), and natural products (Sayed et al 2001).

Ministry of Agriculture banned all conventional insecticides in 1996 MINISTERIAL law No.1205. They allowed only bio-insecticides or pheromones or Tricogramma. Current available bio-insecticides are slow acting and not satisfy farmers need.

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Farmers started to use Bio- products(eg *Bacillus thuringiensis*) but due to the very poor performance they stop using these products. Enclosing date bunches in

bags (bagging) received a considerable work and research (Awadalla et al., 1971, , Hussein et al., 1994 ,Temerak and Sayed, 2003). Also, The proper timing of bagging was a good tool for better control (Sayed 2000). Some farmers of the New Valley were following the bagging as mechanical control specially Kharga Oasis. Some are not specially Dakhla Oasis due to the change in the microenvironment around the fruit e. g. light, humidity.

The first use of a natural but very effective and has speed of kill to insect pests of dates was done as cooperation of Assiut university and MOA in the research station of the new vally (*ALL of spinosad*).

The first nationwide program strategy of alternating different chemical classes was adopted by the Egyptian authorities in cooperation with Dr .R.M. Sawiki to combat cotton leafworm and CBW in 1979 (Temerak 2002). The best IPM strategy is to alternate different class of chemical with different mode of action to achieve better efficacy, delay resistance and decrease number of spray and cost (Temerak 2002).

In Egypt,The first use of alternation of different class of safe chemicals on dates to combat the lesser date moth *Batrachedra amydraula* , *Viracola livia* , and the almond moth *Cadra* spp was adopted by temerak and sayed in 2004 in Egypt(Temerak and sayed & sayed and temerak 2007) They reported that: The three rotation program with basic 1st spray of Tracer at 20ml/100L showed insignificant difference. Based on minimum effective rotation doses, alternate Tracer 24SC at 20 ml/100L then Runner 24SC at 15 ml/100L with 2-3 week interval showed almost zero infestation of the above 3 insect pests.

B. amydraula

Based on minimum effective rotation doses, alternate Tracer 24SC at 20 ml/100L then Runner 24SC at 15 ml/100L with 2-week interval showed zero infestation and 1.8% at the last sample of 2004 and 2005, respectively.

V. livia

Based on minimum effective rotation doses, alternate Tracer 24SC at 20ml/100L then Runner 24SC at 15ml/100L with 3-week interval showed 0.3 and 0.6% infestation, before harvest for 2004 and 2005, respectively. However, before harvest, untreated infestation was 33 and 70% in 2004 and 2005, respectively. Also, Successful penetration % of alive larvae into the fruit by using the minimum effective doses of rotation program resulted in almost 1.8, and 1% larvae, before harvest in 2004 and 2005, respectively. However, it reached to 97% and 89% in the untreated in 2004 and 2005, respectively. The last reflect the excellent effect on the neonate larvae. During

the same period, reduction of the 3 rotation programs was 97.8-99 and 99-100% for 2004 and 2005, respectively.

Cadra spp

Based on infestation of the late insect pest *Cadra spp*, same previous trend of the 3- rotation results. Based on minimum effective rotation doses, alternate Tracer 24SC at 20 ml/100L then Runner 24SC at 15 ml/100L with 3-week interval indicated less than 1% and 1% infestation during harvest for 2004 and 2005, respectively. The last reflected important value when storing the fruit. Both products proved to be working under dry hot high temperatures. Both products proved to be working under dry hot temperatures

Key words: Alternation, green chemicals, *B. amydraula* , *Viracola livia* and *Cadra spp*, date fruit.

Mode of Action of Spinosad (Tracer)

Spinosad is activating the nicotinic acetylcholine receptors at special site. It effects ion currents through Gamma- Aminobutyric Acid (GABA) It represents a unique mode of action (Salgado 1997). The availability of a novel chemical group, with a new mode of action that is different from insecticides in current use, is an asset to insecticide resistance management programs (Kranthi et al 2000). Temerak 2003 indicated that spinosad was not easily affected by the existing resistance mechanism.

Mode of Action of Methoxyfenozide (runner)

It imitates the action of the moulting hormone at its receptor .So, it inhibits the synthesis of the new exoskeleton (Salgado 1997).

Application of tracer in rotation with runner are an excellent example of a functional date palm integrated pest management program .

Environmental Protection Agency (EPA) awarded spinosad (tracer) and Methoxyfenozide (runner) the reduced risk product category in 1997 and 2000.

(www.epa.gov/health/reducing). The whitehouse also awarded the green chemistry to spinosad and runner (confirm) in 1999 and 1998, respectively. (www.epa.gov/greemchemistry). Spinosad acts quickly and has speed of kill comparable to most synthetic insecticides . It acts significantly faster than slow acting products like *Bacillus*, *Beauvaria* and other traditional biologicals (Bret *et al.* 1997).

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التسجيل التاريخي لتطبيق القانون الوزاري ١٢٠٥ / ١٩٩٦ للتحويل من استخدام المبيدات الحشرية التقليدية إلى المنتجات الحيوية الآمنة لمكافحة الفيراكولا ليفيا و الباتراشيدرا أميدرولا وحشرة الكادرا على ثمار نخيل البلح بمحافظات الوادي الجديد ، مصر
صباحي تميرك^١ ، احمد أمين سيد^٢

١- قسم وقاية النبات ، كلية زراعة، جامعة أسيوط، مصر

٢- معهد بحوث وقاية النباتات، مركز البحوث الزراعية ، مصر

التطبيق الأول في مصر، لتناوب الأنواع المختلفة للمواد الكيماوية الآمنة على نخيل البلح لمكافحة فراشة البلح الصغرى ، *Viracola livia*، *Batrachedra amydraula* وفراشة اللوز *Cadra spp* قد طبقت من قبل تميرك وسيد في (٢٠٠٤) وسيد و تميرك ٢٠٠٧ . استنادا على النتائج الفعال استخدمت الجرعات الصغيرة الفعالة للتراسير ٢٤ إس سي في ٢٠ مليلتر / ١٠٠ لتر ثم الرانر ٢٤ إس سي في ١٥ مليلتر / ١٠٠ لتر وبفاصل زمني أسبوعين وقد أظهرت النتائج صفر % للإصابة ، ١,٨% في العينة الأخيرة من ٢٠٠٤ و ٢٠٠٥ ، على التوالي .