Effect of Jujube fruit cultivars on chemical control of jujabe fruit fly

Carpomyia incompleta

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Abstract

The present study was conducted the aim of effect of cult Jujube fruit Ziziphus spp. (Rhamanaceae) cultivars (cv.) in the degree of the insecticides used in control of jujabe fruit fly Carpomyia incompleta, at Qurnah region, Basrah, during winter growing season 2010. The revealed that lannate was the most affective against Jujube fruit fly C. incomplete, by lowering its infestation up to 22.9 %, which significantly did not differ with cyfluthrin, relieved 28.1 %, compared with control, reaching 50.4%. The results indicated that the cultivar Zaitooni was such more resistance to the jujube fruit fly infestation, that was decreased to 23.9 % compared to cv. Bambawi, reaching 43.7%. The interactions between pesticides and (cv.) were reduced infestation with using The cyfluthrin and lannate with were cultivar Zaitooni to 13.3 and 17.5% respectively compared with 40.8% at control infestation rates of spraying cv Bambawi with cyfluthrin and lannate were 42.9 and 28.3% respectively compared to 60% at control. The results indicted that the efficiency of lannate and cyfluthrin were increased against fruit fly on cv Ziaotooni by lowering its population density of larvae to 1.75 and 2.25 (larvae /10 fruits) (4.50 larvae /10 fruits at control), compared to cv Bambawi, where the population density of larvae 2.08 and 3.17 (larvae /10 fruits) (4.17 larvae /10 fruits at control).

Insecticides were superior after the 2nd spray, compared with the 1st spray, had infestation rates 20.8 and 46.8% respectively.

Introduction

Fruit fly Carpomyia incompleta (Tephritidae: Diptera) are among the economically important pests, attacking soft fruits worldwide, especially the jujube Ziziphus spp. (Rhamanaceae), Larva fruit fly, Soon after hatching bores into the fruit and feeds there until larval development is complete, the infested fruits drop down and dry off (Aluja and Norrbom, 2001), fruits were attacked by the larvea, starting from flowering and all fruit setting stages, and in the two generations per year, the 1st in November and the other in April (Jebber, 1996). fruits Jujube on an important tree in Basrah province,
beside their high nutrient significance, it represents the main source of income for a wide sector of growers and beekeepers where the jujube honey is produced, (Abbas, 1996; Bowe, 2006). Jujube fruit fly has been a major limiting factor in the production good quality and causing losses of yield (Jebber, 1996; Al-yousuf and Al-Miahy, 2008). The information regarding the effect of insecticides against the fruit fly at Basrah, is very rare, and a different Tephritid fly has been successfully controlled using insecticides. Ahmad et al.,(2005) showed that the some populations of fruit fly Carpomyia vesuviana in Multan and Faisalabad it was resistant to (Talstar 10 EC),trichlorfon (Diptrex 80 SP), lambda-cyhalothrine (Karate 2.5 EC), Malathion (Fyfanon 57 EC) and spinosad (Tracer 240 SC) to lower population it. Susan(1998) has clarified that the most series of ber are the fruit flies Carpomyia vesuviana and C. incomplete when attack the fruits at stage susceptibility generally differs by cultivar ,control of the pest can be attained regulars spraying insecticides

As the differences of fruit fly infestation in Jujube trees cultivars, therefore the present study was conducted to evaluate the role of cultivars in the degree of the insecticides influence on control of Jujube fruit fly in field conditions.

**Materials and methods**

To study of the efficacy of insecticides against Jujube fruit fly, trials were conducted during winter growing season 2010 in a Jujube orchard, at Qurnah region, Basrah province, jujube of 2-4 meters high, healthy and bearding fruiting under normal conditions were chosen. Jujube cultivars Bambawi and Zaitooni were sprayed with cyfluthrin and lannate (table 1), which were applied to runoff fruits of jujube using a handheld sprayer, first spray was done on 10.Nov.2010 and repeated after 4 weeks. Each insecticide applied to three plants (replications) at each cultivar, and three plants treated with water, used as controls. Randomly, 30 fruits (samples) from south, north, east and west region were collected from each tree at different times, (before application, 10 and 20 days after each applied ) and then transferred to the laboratory for recording infestation percentage rate and population ( larva/ 10 fruits) of Jujube fruit fly Carpomyia incomplete on each cultivars, Bambawi and Zaitooni . Percentage data were transformed by arcsine and statistically analyzed according to the complete randomized design and means were separated using Least Significant difference (L.S.D.) test (Al-Rawi and Khalaf-Allah,1980).
### Table (1): Insecticides using against Jujube fruit fly

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Active Ingredient</th>
<th>Dosage rate/100 L</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lannate 90 SP</td>
<td>Methomyl</td>
<td>50 gr.</td>
<td>Dupont</td>
</tr>
<tr>
<td>Baythroid</td>
<td>%50 cyfluthrin</td>
<td>100ml.</td>
<td>Byer Crop Science Germany</td>
</tr>
</tbody>
</table>

**Results**

The results revealed that the two insecticides lannate and cyluthrin were significantly effective against Jujube fruit fly *C. incomplete* (figure 1), the rate of infestation reduced 22.9 and 28.1 % respectively, compared to 50.4% at control.

![Figure 1: Effect of insecticides on infestation percentage of Jujube fruit fly C. incomplete.](image)

The result of table 2 showed that the cultivar Zaitooni was more resistance to the jujube fruit fly infestation, it was decreased to 23.9 % compared to cv. Bambawi, was reached 43.7%. Results of cvs. Zaitooni and Bambawi spraying with insecticides indicated to the increasing of efficiency of cyfluthrin and lannate on cv. Zaitooni, it reduced the infestation rates to 13.3 and 17.5% respectively (40.8% at control) compared with infestation rates of spraying cv Bambawi with cyfluthrin and lannate were 42.9 and 28.3% respectively (60 % at control).
Table (2): The effect of the interaction of cultivar/ insecticides on infestation rate of Jujube fruit fly *C. incomplete*.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Insecticides</th>
<th>Before application data after(day)</th>
<th>Insecticides before application data after(day)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Bambawi</td>
<td>Cyfluthrin</td>
<td>70.0</td>
<td>68.3</td>
<td>46.7</td>
</tr>
<tr>
<td></td>
<td>Lannate</td>
<td>66.7</td>
<td>53.3</td>
<td>36.7</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>60.0</td>
<td>86.7</td>
<td>70.0</td>
</tr>
<tr>
<td>Zaitooni</td>
<td>Cyfluthrin</td>
<td>60.0</td>
<td>23.3</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Lannate</td>
<td>70.0</td>
<td>26.7</td>
<td>23.3</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>70.0</td>
<td>66.7</td>
<td>50.0</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td>45.2</td>
</tr>
<tr>
<td>L.S.D. 0.05 value</td>
<td></td>
<td></td>
<td></td>
<td>46.8</td>
</tr>
</tbody>
</table>

L.S.D. value for interaction = N.S

Insecticides were superior after the 2nd spray, compared with the 1st spray, having infestation rates 20.8 and 46.8% respectively. The results of Table 2 elucidated that the highest effective of insecticides in 20th day after the spraying, it resulted in the lowest percentage of infestation (25.8%), compared with the infestation rates after 10th days after the spraying, reaching 41.8%.
Figure 2: Effect of the time on chemical control of Jujube fruit fly *C. incomplete*.

The results of before spray and offe two sprays population density of Jujube fruit fly in cvs Bambawi and Zaitooni fruits has given in table 3 revealed that lannate was the most effective against the fruit fly by lowering its population up to 1.92 larvae /10 fruits and significantly did not differ with cyfluthrin, where the population average 2.71 larvae /10 fruits, compared with control, reaching 4.33 larvae /10 fruits.

Table (3): The effect of the interaction of cultivar/ insecticides on the population density of larva Jujube fruit fly *C. incomplete*.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Insecticides</th>
<th>Before application</th>
<th>data after(day) Before application</th>
<th>data after(day) Before application</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 20</td>
<td>10 20</td>
<td></td>
</tr>
<tr>
<td>Bambawi</td>
<td>Cyfluthrin</td>
<td>6.67</td>
<td>2.00 7.67</td>
<td>2.67 0.33</td>
<td>3.17</td>
</tr>
<tr>
<td></td>
<td>Lannate</td>
<td>5.00</td>
<td>2.67 5.33</td>
<td>0.33 0.00</td>
<td>2.08</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>6.67</td>
<td>7.33 3.67</td>
<td>3.67 2.00</td>
<td>4.17</td>
</tr>
<tr>
<td>Zaitooni</td>
<td>Cyfluthrin</td>
<td>8.67</td>
<td>4.00 2.00</td>
<td>2.67 0.33</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>Lannate</td>
<td>7.67</td>
<td>2.67 0.00</td>
<td>4.33 0.00</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>15.67</td>
<td>8.00 5.67</td>
<td>4.00 0.33</td>
<td>4.50</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td>4.44 4.06</td>
<td>2.94 0.50</td>
<td>4.25</td>
</tr>
</tbody>
</table>

L.S.D. value = 8.56
The results indicted that the efficiency of lannate and cyfluthrin were increased against fruit fly on cv Ziatooni by lowering its population to 1.75 and 2.25 larvae /10 fruits comparing 4.50 larvae /10 fruits at control , while the cv Bambawi, where the population 2.08 and 3.17 (larvae /10 fruits) (4.17 larvae /10 fruits at control). highest effective of insecticides was in 2nd spray, by decreasing the population to 1.72 larvae /10 fruits, compared to 4.25 larvae /10 fruits in 1st spray, but there is no significant differences were observed in the values of interactions.

Present study indicated that there are differences in infestation percentage and population density of Jujube fruit fly on Jujube fruits cultivar Bambawi and Ziatooni, treated with insecticides, it was clarified that cv Ziatooni was resistance to fruit fly and the efficacy of cyfluthrin and lannate were increased against the insect on cv Zaitooni. From these results, it might be concluded that the synergistic interactions at the insecticides with resistance cultivars against the fruit fly. the result may be belonging to physiological different between juicily ripening of Ju jube fruits where the averages were 120 day with cv. Ziatooni compared with cv. Bambawi where the averages were 180 day(Mohammd,2011),or may be difference the aqueous content in Jujube fruits where its was 73-76% in cv. Ziatooni compared with 70% in cv. Bambawi(Al-ebresam,2009) various studied have shown significant differences that insects reared on resistant plant cultivars are less tolerant to insecticides when compared with individuals reared on susceptible cultivars (Hinks and Suprr, 1989 ; Mohamed and van Emden, 1989 ; Ghidiu et al 1990). Culvert's and Radcliffeadcliffe (1984) found that interactions between aphid parasitism, alfalfa cultivar resistance, and insecticide on pea aphid, *Acyrthosiphon pisum* (Harris).Saljoqi and Emden(2003) reported that the synergistic interaction of insecticides with resistant potato cultivars on *Myzus persicae*. 

| L.S.D. 0.05 value | 1.001 | N.S | N.S |

L.S.D. value for interaction = N.S
References


grasshopper (Orthoptera: Acrididae) to deltamethrin and dimethoate. J.Econ.Entom., 82:721-726.


تأثر أصناف السدر زيزفus sp. في المقاومة الكيميائية لدبابية ثمار السدر Ziziphus sp. incompleta

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ملخص

نفت هذه الدراسة لغرض معرفة دور الأصناف النباتية للسدر في تأثير المبيدات الكيميائية ضد ذبابة Ziziphus sp. (Tephritidae: Diptera) Carpomyia incompleta في منطقة القرنية في البصرة خلال موسم النمو الربيعي 2010. وشملت النتائج إلى تفوق المعاملة lannate لذباب ثمار السدر، إذ انخفضت نسبة الإصابة إلى 22.9%، ولم يختلف معنوي عن المعاملة cyfluthrin، والتي كانت نسبة الإصابة فيها 28.1%، مقارنة مع المعاملة السيطرة والبالغة 50.4%.

ство

3.17%، ولاحظ أن كشف المبيدات الزيتوني كان أكثر مقاومة لدبابية ثمار السدر، إذ بلغت نسبة الإصابة فيها 23.9% مقارنة بالصنف المبيدات الزيتوني والتي بلغت نسبة فيها 43.7%، وتبين من التداخل بين تأثير المبيد والصنف انخفاض نسبة الإصابة بذبابة ثمار مع المبيدات lannate وcyfluthrin و 17.5% على التوالي مقارنتا مع نسبة الإصابة في المعاملة السيطرة والبالغة 40.8%. كما انخفضت نسبة الإصابة في الصف المبيدات المعاملة بالمبيدات lannate وcyfluthrin إلى 42.9% و 28.3% على التوالي مقارنتا مع نسبة الإصابة في المعاملة السيطرة والبالغة 60%. كما أشارت النتائج إلى كفاءة المبيدات lannate وcyfluthrin على الصنف الزيتوني في خفض الكثافة العددية لليرقات على ثمار السدر إلى 1.75 و 2.25 برهقة/10 ثمار Meta برهقة في المعاملة السيطرة، كما بلغت الكثافة العددية لليرقات على ثمار الصف المبيدات المعاملة بالمبيدات lannate وcyfluthrin و 2.08 و 3.17 برهقة/10 ثمار على التوالي مقارنتا مع 4.17 برهقة/10 ثمار في المعاملة السيطرة. إن تأثير المبيدات كان أعلى بعد الرشة الثانية مقارنة بالرشع الأولى، والتي بلغت فيها نسبة الإصابة 20.8% و 46.8% على التوالي.