

## **Effectiveness of Two Insecticides to Control Melon Fruit Fly (*Bactrocera Cucurbitae* Coq.) In Cucumber (*Cucumis Sativus L*). Crop at Anse Boileau Seychelles**

**O.A.Oke**

*Department of Biological Sciences University of Agriculture  
Abeokuta, Nigeria  
Vegetable Evaluation Research Station, Anse Boileau  
Department of Natural Resources, P. O. Box 166, Victoria, Mahe  
Republic of Seychelles  
E-mail: olubodeoke@yahoo.com*

### **Abstract**

Experiments were carried out at the Vegetable Evaluation and Research Station at Anse Boileau, Mahe, Seychelles to test the effectiveness of Lambda-cyhalothrine and Deltamethrine in controlling melon fruit fly in cucumber. Results obtained show that the two insecticides were effective in controlling melon fruit fly in cucumber. However, Lambda-cyhalothrine was found to be better as its spray reduced more number of melon fruit fly pupae that emerged than those of the Deltamethrine. Also Lambda-cyhalothrine increase the quality of harvested cucumber fruits in relation to infestation of fruits with ovipositor marks.

**Keywords:** Effectiveness, treatment, transplant, ovipositor mark, rearing, insecticide.

### **Introduction**

The melon fruit fly, *Bactrocera cucurbitae* (Coquillett) is a diptera of the family tephritidae. Tephritidae have a major economic importance in the tropical areas. Vayssieres et al (2006) it is world wide and consists of 4000 species. It is found across Asia, part of Africa, the pacific islands and in the Indian Ocean. It is believed that the species has been. introduction into the Indian Ocean region from the Indian sub-continent. It was accidentally introduced into the Seychelles in the late 1999. It is now established on the two main islands of Seychelles. namely Mahe and Praslin, and possibly on other islands (Plant Protection Services of Seychelles 2006). It is considered the most destructive pests of cucumbers, melons and other related crops. Apart from being a very serious pest of these cucurbitit crops it will sometimes attack non-cucurbit host. The melon fruit fly can attack flowers as well as fruit. and additionally will attack even stem and root tissue. Heavy attacks may occur even before the fruit has set. with eggs laid into unopened male and female flowers, and larvae may even develop in the stems and leaf stalks. The aim of this project is to evaluate the efficacy of two biological Insecticides namely lambda- cyhalothrine (karate zone) and deltamethrines (decis) in controlling melon fruit fly *Bactrocera cucurbitae* on cucumber.

## Materials and Methods

The experiment was carried out from April to June, 2007 at the Vegetable Evaluation and Research Station Farm Anse Boileau Seychelles to evaluate the efficacy of the two insecticides lambda-cyhalothrine and deltamethrin in the control of melon fruit fly (*Bactrocera cucurbitae*- coq) on cucumber. The crop used was cucumber (variety slicer no.5). The seeds were sown in the nursery in early April, 2007 at the rate of one seed per poly pot. Cultural management including weeding, watering were carried out in the usual manner.

The experimental plot consisting of soil classified as sandy-loam was cleared, rotovated and divided into treatment plots. The treatments were replicated three times in a randomized complete block design. The seedlings were transplanted two weeks after nursery sowing to each treatment plot. Snail pellets were applied to the seedlings to prevent snail infestation. The cucumber plants were all staked at one week after transplanting using individual method of staking. Three side dressers with compound fertilizer NPK (12: 12: 17) at the rate of 23g/ plant (Ripjma, 1991) was applied at three week intervals from transplanting date After each application, the plants were immediately irrigated. The foliar spray insecticide applications commenced immediately ovipositor mark was noticed on the cucumber fruit. A total of three foliar spray applications were carried out for each treatment plot area. The harvested fruits were reared for the melon fruit fly for about 10 days in plastic bags containing some sand. The plastic bags were pierced to have holes for aeration of the pupae. A total of five harvests were done and for each harvest, data taken included number of fruits with ovipositor marks and number of pupae of melon fruit fly. All data obtained were statistically analyzed for analysis of variance (ANOVA) while the least significant difference (LSD) was used to separate treatment means.

## Results and Discussion

**Table 1:** Meteorological information, Anse Boileau, Seychelles, (April-June, 2007)

Months	Average Monthly Temperature (°C)		Average Monthly Rainfall (mm)	No. of Rainy Days (No.)	Average Rel. Hum. (%)
	Min	Max			
April 2007	23.8	32.7	7.1	17	75.3
May 2007	24.8	32.1	6.0	15	75.9
June 2007	23.8	30.2	7.3	18	78.7

Source: Vegetable Evaluation and Research Meteorological Station, Anse Boileau, Seychelles

**Table 2:** Effectiveness of insecticides on mean number of fruits with ovipositor marks and mean number of pupae of melon fruit fly.

	Treatments: Mean number of fruits with ovipositor marks						Mean number of pupae of melon fruit fly					
	Harvest						Harvest					
	1	2	3	4	5	Total	1	2	3	4	5	Total
Lambda-Cyhalothrine	1.33a	2.00a	2.67a	2.00a	1.33a	9.33a	0a	0a	0a	0a	0a	0a
Delta-Methrine	2.00a	1.00a	2.33a	2.50a	2.33a	0.33a	0.33a	0.00a	0.33a	2.66a	0a	3.33a
UN- Treated	5.00a	5.33a	3.00a	2.33a	4.67a	20.33a	0.67a	0.67a	5.67a	4.67a	5.33a	17.0a
Mean	2.78	2.78	2.67	2.28	2.78	13.00	0.33	0.22	2.0	2.44	1.78	6.78
CV%	26.2	26.2	29.3	5.98	10.59	12.39	57.7	99.5	18	55.3	63.5	22.9
LSD P=0.05	3.9					2.0	2.45					10.5

Means in the same column followed by the same letters are not significantly different (P=0.05) using the LSD.

Table 1 shows the meteorological information on the trial site from April to June, 2007. The minimum and maximum temperatures during the growth period of the cucumber crop ranged from 23.8°C to 32.7°C. The average relative humidity for the growth months ranged from 75.3% to 78.7%. The maximum temperatures and the corresponding relative humidity range were high for the cucumber

crop. This view had earlier been reported by Valenzuela et al 2003 and also by Ijoyah and Rakotomavo 2005. They reported that optimal temperature range of 20°C and 25°C is ideal for cucumber crop with growth reduction occurring above 30°C Agarwal et al (1987) reported that cucumbers are especially susceptible to pest attack when growing conditions are less than ideal. Generally rainfall was recorded low (6.0mm-7.3mm) during the crop growth period and the highest average monthly rainfall and highest number of rainy days were recorded for the month of June.

Table 2 shows the results of the effectiveness of the insecticides on the mean number of fruits with ovipositor marks and the mean number of pupae of melon fruit fly from the reared cucumber fruits from the first to the fifth harvests. There were no adult melon fruit fly emergence from the reared cucumber fruits. There were no significant difference in the mean number of fruits with ovipositor marks in the 1<sup>st</sup>, 3<sup>rd</sup> and 4<sup>th</sup> harvests in the sprayed and unsprayed plots, but in the 2<sup>nd</sup> and the 5<sup>th</sup> harvests the plots that were sprayed with the insecticides significantly recorded reduced number of fruits with ovipositor marks. This could be linked to the effectiveness of insecticides.

Significant difference was notably seen in the mean number of pupae of melon fruit fly from the spray and unsprayed plots during the rearing of the melon fruit fly from the cucumber fruits of the 3<sup>rd</sup> harvest. From the 1<sup>st</sup> to 5<sup>th</sup> the mean number of pupae of melon fruit fly was observed to be highest in the untreated plots with mean values of 0.67, 0.67, 5.67, 4.67 and 5.33 respectively treated plots. Plot treated with lambda-cyhalothrine had 0.00 mean numbers of pupae from the 1<sup>st</sup> to 5<sup>th</sup> harvest while plot treated with deltamethrine had 0.33, 0.00, 0.33, 2.66, 0.00 and 3.33 respectively. The results in table 2 generally show that the two Insecticides effectively reduced the number of melon fruit fly pupae that emerged compared to the un-treated plot.

## Conclusion

From the results obtained, the two insecticides were effective to control melon fruit fly in cucumber. However, Lambda-cyhalothrine was found to be better as its spray reduced the number of melon fruit fly pupae that emerged than that of Deltamethrine. Also, there is an increase in the quality of harvested cucumber fruits when sprayed with Lambda-cyhalothrine in relation of infestation of fruits with ovipositor marks.

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