EFFICACY OF FEMALE ATTRACTANT TRAPPING SYSTEMS FOR MEDFLY FOR USE IN SUPPRESSION PROGRAMMES

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Abstract

Several species of fruit flies cause serious losses to fleshy fruits in Mauritius. Due to fruit production being confined mainly to backyard gardens, traditional methods of control do not give satisfactory results. Full cover sprays with chemicals also pose potential environmental and health risks. Alternative control methods were developed and an area-wide control programme was conceived, using bait application to bring down fruit fly population, followed by intensive trapping of males, using pheromones, to keep the population at low levels. An effective attractant system for mass trapping of females integrated into the wide area programme would greatly enhance control. The use of synthetic food-based attractants for trapping *Ceratitis capitata* and other fruit fly species was investigated in two phases and compared with different trapping systems. In the Phase III experiments, a two component lure, ammonium acetate + putrescine (FA-2) and a three component lure, ammonium acetate + putrescine + trimethylamine (FA-3) were tested in different traps and compared with standard liquid protein-baited International Pheromone's McPhail Trap (IPMT). Frutect trap, Tephri-trap and Jackson trap with Trimedlure were also used. The medfly female catch with the FA-3 lure used in the Open Bottom Dry Trap outnumbered the catches in other traps. In Phase IV, the final year of the trial, the FA-3 lure was tested in wet and dry IPMT and Tephri traps. These were compared with IPMT containing NuLure + borax (NU+B) as standard and with locally developed traps. The FA-3 lure gave the highest catches of female medflies in the IPMT with water as retaining device followed by IPMT with DDVP, although catches were not significantly different from IPMT with NU+B.

1. INTRODUCTION

Fruit flies are serious pests of fruits in Mauritius, a small tropical island of 1800 km^2, situated at about 1000 km off the east coast of the African mainland [1]. A total of eight species are present in Mauritius and the damaging species to fleshy fruits are the mango fly, *Bactrocera zonata* Saunders, the Natal fly, *Ceratitis rosa* Karsch, the medfly, *Ceratitis capitata* Wiedemann and the Ber fly, *Carpomya vesuviana* Costa. The latter is restricted to jujube (*Ziziphus jujuba* Lam.) [2, 3]. The melon fly, *B. cucurbitae* Macquart, the most dominant species of fruit fly in Mauritius, is an important pest of cucurbits and has not been recorded from fleshy fruits as in other countries [4, 5]

The medfly presence in Mauritius dates back to 1885 [4]. It was the main species existing until the late 1950s when it was gradually displaced by *C. rosa* and eventually both were displaced by *B. zonata*, as from 1987 [6, 7].

Because fruit production is confined mostly to backyard gardens, little fruit fly control is practise by individual householders. The effectiveness of the control is limited by the fact that the neighbours of concerned householders do not spray their trees, resulting in constant invasion from adjacent gardens. Full cover sprays with chemicals also pose potential environmental and health risks in gardens and for persons applying the sprays [8]. Research on fruit fly control was therefore geared towards development of alternative control methods, which are environment friendly and easily accessible to the public. An area-wide control programme utilizing bait application and male annihilation techniques was initiated in April 1994 and is currently being implemented over one third of the island [9]. Additionally, due to the accidental introduction of the Oriental fruit fly, *Bactrocera dorsalis* in Mauritius in June 1996, an eradication programme against this pest is being run in the southern part, using the

same methods. The National Programme in the North and the eradication programme in the South cover a total area of about 850 km^2 [7].

All lures presently available attract only males and the development of a female attractant system for fruit flies will be a major breakthrough in fruit fly control. Such a system could be integrated in wide area control programmes for suppression of fruit fly populations. Female attractant traps would also give an additional tool for monitoring of populations in a wide area control programme.

1.1. Development of female medfly attractant systems

Trapping systems for fruit flies, whether used for detection, surveillance, monitoring or mass trapping for suppression purposes, presently utilise lures for trapping males or traps baited with protein hydrolysate solution which catch both males and females [10]. Investigations were initiated to develop a female attractant system to trap medfly, which could be used for use in SIT programmes, detection programmes or in suppression programmes [11, 12].

An international network research project for the development of a female attractant system for medfly trapping has been operated under IAEA/FAO, as a Co-ordinated Research Programme (CRP). Trials effected in the final phases of the CRP, that is Phase III and IV are reported here.

2. MATERIALS AND METHODS

2.1. Sites of study - Phases III and IV

Organised orchards are quite rare in Mauritius, and, with about half the island being under chemical treatment and the medfly not being the dominant species, very few ideal sites were available.

2.1.1. Site 1

Site 1 was used for both CRP Phase III (20 December 1996 to 13 February 1997 and Phase IV (24 October 1997 to 18 December 1997).

Field tests were carried out at Pointe aux Sables, a coastal region in the West, where the fruits of the Indian almond tree, *Terminalia catappa* L. and coffee, *Coffea arabica* L. are the main medfly hosts. However, medfly heavily infests hosts other fleshy fruits, such as chilly, *Capsicum annuum* L. and liane poc poc (a wild creeper), *Passiflora suberosa* L. The Indian almond tree is grown mainly for shade and produces a large number of non-edible fruits, which do not receive any chemical treatment. Other probable medfly hosts in the region are Chinese guava, *Psidium cattleianum* Sabine, mango, *Mangifera indica* L., guava, *Psidium guajava* L., jujube, *Ziziphus jujuba* Lam., bullock's heart, *Annona reticulata* L., water apple, *Syzygium samarangense* (Blume) Merr. & Perry, peach, *Prunus persica* (L.) Batsch and carambola, *Averrhoa carambola* L. It should be noted that citrus is not a host of medfly in Mauritius.

Apart from these fruit trees, in general, the vegetation is made up of grasses, logwood trees, *Haematoxylon campechianum* L. and other non-fruit fly host trees, such as custard apple, *Annona squamosa* L., sour sop, *Annona muricata* L., tamarind, *Tamarindus indica* L. and *Casuarina* sp.

The elevation of the region is between 5 to 30 m above sea level. Monthly rainfall records ranged from 0 mm in driest months (May to October) to 265 mm in summer months (November to April) during the past three years.

2.1.2. Site 2

Similarly, Site 2 was used for both CRP Phase III (28 October 1997 to 23 December 1997) and Phase IV (07 January 1998 to 02 March 1998).

Trials were conducted at Bel Ombre, a coastal village in the South, where the fruit trees and vegetation are similar to Site 1. Its elevation is between 3 to 20 m above sea level. Monthly rainfall readings during the past three years ranged from 5mm in driest months as compared to 544 mm in summer months.

2.2. Traps and attractants

2.2.1. Phase III

A two component (FA-2), consisting of ammonium acetate (AA) and Putrescine (P), had been developed and tested in a dry trap during Phase I of the IAEA/FAO CRP for Medfly Female Attractant Studies, in collaboration with USDA/ARS.

A modified trapping system, the Open Bottom Dry Trap (OBDT) was used in Phase II. A third component, trimethylamine (TMA) was added to the food attractants in Phase III. The protocol for this Phase was designed to determine trapping efficiency of the FA-3 (AA, P & TMA), in comparison with FA-2 (AA & P), in OBDT and with the pre-baited Frutect traps. Both FA-2 and FA-3 combinations were also tested in local traps. The locally-designed trap consisted of a round plastic container with lid, of 140 mm in diameter and 105 mm in height. Four holes of 22 mm diameter were made on the sides. Jackson traps with Trimedlure (JT, TML) and McPhail traps with NuLure + borax (NU+B) were used as standards. Tephri traps with NU+B and TML were also included.

A randomised complete block design with 5 blocks consisting of 8 traps per block, was used in backyard situations. The IAEA protocol had 7 treatments, but an eighth treatment was added as Tephri traps were also provided. All traps were hung on *T. catappa* trees, about two m above ground level. Trap catches were recorded twice a week and the traps within a block were rotated sequentially after each reading. Fruits susceptible to medfly attack were collected once a week for data on infestation.

The attractant systems used in the trials were as follows:

- Jackson Trap with sticky insert baited with Trimedlure Plug (JT, TML)
- OBDT with sticky insert baited with FA-2 (OBDT, FA-2)
- OBDT with sticky insert baited with FA-3 (OBDT, FA-3)
- Locally designed trap baited with FA-2 (CC, FA-2)
- Locally designed trap baited with FA-3 (CC, FA-3)
- International Pheromone's McPhail Trap baited with a mixture containing 88 % water, 9 % Nulure and 3 % borax (IPMT, NU+B)
- Frutect trap, which is pre-baited (Frutect)
- Tephri trap baited with a mixture containing 88 % water, 9 % NuLure and 3 % borax and Trimedlure Plug (Tephri, NU+B, TML)

2.2.2. Phase IV

Phase IV of the CRP was targeted at testing the FA-3 synthetic lure in wet and dry traps. Wet traps were IPMT and Tephri traps, both with water, whereas for dry traps IPMT and Tephri traps with DDVP strips were used. The IPMT, NU+B was the standard trap. A local trap with the FA-3 lure and DDVP as insect retaining device was also included for comparison, as well as a JT, TML standard for male medfly catches.

A randomised block design with five blocks consisting of 7 treatments per block was used. The procedures are the same as in Phase III. The trials were conducted according to Protocol for Phase IV of the CRP. Treatments were as follows:

- JT, TML
- IPMT, NU+B
- IPMT baited with FA-3 and water, as a retaining device (IPMT, FA-3, wet)
- IPMT baited with FA-3 and a toxicant plug, DDVP, as a retaining device (IPMT, FA-3, dry)
- Tephri trap baited with FA-3 and a toxicant plug, DDVP, as a retaining device (Tephri FA-3, dry)
- Tephri trap baited with FA-3 and a toxicant plug, DDVP and water, as retaining devices (Tephri, FA-3, DDVP, wet)
- Locally designed trap baited with FA-3 and a toxicant plug, DDVP, as a retaining device (CC, FA- 3, dry)

Observations on the maturity of captured female medflies were carried out.

3. RESULTS

The trapping data for Phase III and IV for Sites 1 and 2 are summarised in Tables I - IV, respectively. Detailed results have been summarised and converted into Fly/Trap/Day (F/T/D). Data for trapping of other fruit flies are given in Tables V - VIII for CRP Phase III and Phase IV, respectively.

Statistical analysis by ANOVA (Table IX -XII) and Duncan's Multiple Range Test have been carried out on log transformed data from female targeted traps and therefore do not include figures from Jackson traps.

3.1. Capture of medflies

In the Phase III trials, results on the efficacy of OBDT, FA-3 were consistent at both sites. This trapping system outcaptured all other traps in the case of female medfly. However, at Site 1 - Pointe aux Sables, there was no significant difference between OBDT, FA-3, OBDT, FA-2, and IPMT, NU+B. At Site 2 - Bel Ombre, the female medflies trapped in OBDT, FA-3, Frutect, and Tephri, NU+B, TML showed no significant difference.

In Phase IV experiments, IPMT , FA-3 caught the highest number of female medflies at both sites. However, there was no significant difference between IPMT, FA-3, wet, IPMT, FA-3, dry, and the standard trap, IPMT, NU+B.

Text cont. on p. 119.

TABLE I. CAPTURE OF *C. capitata* IN PHASE III EXPERIMENT AT POINTE AUX SABLES

Country :	Mauritius
Host :	Indian Almond
Altitude :	5 - 30 metres
Avg. Temp, Min.-Max. :	23.9 - 31.7
Avg. RH, Min.-Max. :	41.7 % - 63.8 %
Trapping period (dates) :	20.12.96 - 13.02.97
No. of Trap Days (# traps per treatment x # days) :	280
Jackson trap capture (# Total F/T/D) :	0.68
% females in Jackson trap ((#Females#Total) * 100) :	19.41 (may be due to contamination)
No. of Jackson trap days (# traps x # days) :	280
Average no. of larvae per kg of fruit :	3.2

Trap/Lure Treatment			Flies per Trap per Day			Relative Trap Efficiency			% Females per Trap
Trap	Bait	Retention	#Males	#Females	#Total	%Males	%Females	%Total	(# fem/#tot)
OBDT	FA-2	sticky insert	0.10	0.18 ab	0.28	12.00	16.23	14.45	64.94
OBDT	FA-3	sticky insert	0.18	0.35 a	0.53	22.67	31.49	27.77	65.54
CC	FA-2	DDVP	0.06	0.07	0.13	7.11	6.82	6.94	56.76
CC	FA-3	DDVP	0.06	0.08 b	0.14	7.56	7.47	7.50	57.50
IPMT	NU+B	water	0.04	0.16 b	0.21	5.33	14.94	10.88	79.31
Frutect	Prebaited	glue	0.08	0.13 b	0.21	10.22	11.69	11.07	61.02
Tephri	TML ,NU +B	water	0.28	0.13 b	0.41	35.11	11.36	21.39	30.70

Means followed by the same letter are not significantly different at P=0.05

TABLE II. CAPTURE OF *C. capitata* IN PHASE III EXPERIMENT AT BEL OMBRE

Country :	Mauritius
Host :	Indian Almond
Altitude :	3 – 20 metres
Avg. Temp, Min.-Max. :	12.76 - 28.7
Avg. RH, Min.-Max. :	57 % - 97 %
Trapping period (dates) :	28.10.97 – 23.12.97
No. of Trap Days (# traps per treatment x # days) :	280
Jackson trap capture (# Total F/T/D) :	7.53
% females in Jackson trap ((#Females#Total) * 100) :	0
No. of Jackson trap days (# traps x # days) :	280
Average no. of larvae per kg of fruit :	2.6

Trap/Lure Treatment			Flies per Trap per Day			Relative Trap Efficiency			% Females per Trap
Trap	Bait	Retention	#Males	#Females	#Total	%Males	%Females	%Total	(# fem/#tot)
OBDT	FA-2	sticky insert	0.35	0.26	0.61	3.80	6.62	4.66	43.27
OBDT	FA-3	sticky insert	0.88	1.13 a	0.88	9.69	28.29	15.35	56.13
CC	FA-2	DDVP	0.21	0.16	0.37	2.27	3.94	2.78	43.14
CC	FA-3	DDVP	0.43	0.36 b	0.43	4.67	9.04	6.00	45.91
IPMT	NU+B	water	0.31	0.4 b	0.31	3.41	10.03	5.43	56.28
Frutect	Prebaited	glue	1.46	0.92 ab	1.46	16.08	23.01	18.19	38.53
Tephri	TML NU – B	water	5.47	0.76 ab	5.47	60.08	19.07	47.59	12.21

Means followed by the same letter are not significantly different at P=0.05

TABLE III. CAPTURE OF *C. capitata* IN PHASE IV EXPERIMENT AT POINTE AUX SABLES

Country :	Mauritius
Host :	Indian Almond
Altitude :	3 - 20 metres
Avg. Temp, Min.-Max. :	19.9oC - 29.4oC
Avg. RH, Min.-Max. :	40% - 99.9%
Trapping period (dates) :	24.10.97 - 18.12.97
No. of Trap Days (# traps per treatment x # days) :	280
Jackson trap capture (# Total F/T/D) :	4.932
% females in Jackson trap ((#Females#Total) * 100) :	0
No. of Jackson trap days (# traps x # days) :	280
Average no. of larvae per kg of fruit :	11.3

Trap/Lure Treatment			Flies per Trap per Day			Relative Trap Efficiency			% Females per Trap
Trap	Bait	Retention	#Males	#Females	#Total	%Males	%Females	%Total	(# fem/#tot)
IPMT	NU+B	water	0.46	0.564 abc	0.46	14.46	16.46	38.11	24.84
IPMT	FA-3	water	1.31	1.218 a	1.31	40.93	35.52	29.85	72.36
IPMT	FA-3	DDVP	0.62	0.714 ab	0.62	19.24	20.83	23.54	57.73
Tephri	FA-3	DDVP	0.40	0.55 bc	0.40	12.46	16.04	4.85	55.00
Tephri	FA-3	DDVP + water	0.31	0.325 c	0.31	9.68	9.48	2.18	33.33
CC	FA-3	DDVP	0.10	0.057	0.16	3.23	1.67	1.46	66.67

Means followed by the same letter are not significantly different at P=0.05

TABLE IV. CAPTURE OF *C. capitata* IN PHASE IV EXPERIMENT AT BEL OMBRE

Country :	Mauritius
Host :	Indian Almond
Altitude :	3 - 20 metres
Avg. Temp, Min.-Max. :	28.1 - 31.7
Avg. RH, Min.-Max. :	78.1 % - 94.4 %
Trapping period (dates) :	07.01.98 - 02.03.98
No. of Trap Days (# traps per treatment x # days) :	280
Jackson trap capture (# Total F/T/D) :	75.18
% females in Jackson trap ((#Females#Total) * 100) :	0
No. of Jackson trap days (# traps x # days) :	280
Average no. of larvae per kg of fruit :	6.7

Trap/Lure Treatment			Flies per Trap per Day			Relative Trap Efficiency			% Females per Trap
Trap	Bait	Retention	#Males	#Females	#Total	%Males	%Females	%Total	(# fem/#tot)
IPMT	NU+B	water	0.05	0.14 ab	0.05	12.38	19.31	15.49	54.86
IPMT	FA-3	water	0.12	0.32 a	0.12	32.38	44.06	38.14	48.10
IPMT	FA-3	DDVP	0.15	0.2 ab	0.15	39.05	27.72	20.06	53.62
Tephri	FA-3	DDVP	0.03	0.04 c	0.03	8.57	5.45	14.31	57.89
Tephri	FA-3	DDVP + water	0.02	0.01 c	0.02	5.71	1.49	9.58	51.12
CC	FA-3	DDVP	0.01	0.01 c	0.01	1.90	1.98	2.42	35.56

Means followed by the same letter are not significantly different at P=0.05

TABLE V. CAPTURE OF DIFFERENT FRUIT FLY SPECIES (IN F/T/D) IN PHASE III EXPERIMENT AT POINTE AUX SABLES

	C. rosa			*B. zonata*			*B. cucurbitae*			*D. ciliatus*		
Trap Type	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
JT, TML	0.100	1.011	1.111	0.000	0.007	0.007	0.000	0.004	0.004	0.000	0.000	0.000
OBDT, FA-2	0.186	0.125	0.311	0.157	0.157	0.314	0.021	0.025	0.046	0.000	0.004	0.004
OBDT, FA-3	0.300	0.182	0.482	0.121	0.079	0.200	0.011	0.043	0.054	0.000	0.004	0.004
CC ,FA-2	0.168	0.211	0.379	0.086	0.071	0.157	0.000	0.014	0.014	0.000	0.000	0.000
CC , FA-3	0.457	0.339	0.796	0.086	0.064	0.150	0.007	0.000	0.007	0.000	0.000	0.000
IPMT, NU+B	0.489	0.332	0.821	0.854	0.479	1.332	0.114	0.089	0.204	0.004	0.007	0.011
Frutect	0.082	0.054	0.136	0.104	0.061	0.164	0.000	0.021	0.021	0.000	0.004	0.004
Tephri , NU+B, TML	0.250	0.518	0.768	0.089	0.064	0.154	0.000	0.007	0.007	0.000	0.000	0.000

TABLE VI. CAPTURE OF DIFFERENT FRUIT FLY SPECIES (IN F/T/D) IN PHASE III EXPERIMENT AT BEL OMBRE

	C.rosa			*B.zonata*			*B.cucurbitae*			*D.ciliatus*		
Trap Type	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
JT, TML	0.007	3.400	3.407	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OBDT, FA-2	0.079	0.064	0.143	0.000	0.004	0.004	0.011	0.004	0.014	0.011	0.007	0.018
OBDT, FA-3	1.807	0.482	2.289	0.000	0.000	0.000	0.032	0.011	0.043	0.000	0.004	0.004
CC, FA-2	0.404	0.264	0.668	0.004	0.000	0.004	0.014	0.011	0.025	0.000	0.004	0.004
CC, FA-3	0.811	0.632	1.443	0.004	0.000	0.004	0.007	0.004	0.011	0.000	0.000	0.000
IPMT, NU+B	4.161	0.936	5.096	0.014	0.021	0.036	0.321	0.154	0.475	0.032	0.043	0.075
Frutect Pre-baited	1.164	0.700	1.864	0.007	0.011	0.018	0.032	0.043	0.075	0.036	0.029	0.064
Tephri, NU+B, TML	1.661	1.925	3.586	0.004	0.000	0.004	0.054	0.050	0.104	0.000	0.007	0.007

TABLE VII. CAPTURE OF DIFFERENT FRUIT FLY SPECIES (IN F/T/D) IN PHASE IV EXPERIMENT AT BEL OMBRE

	C. rosa			*B. zonata*			*B. cucurbitae*			*D. ciliatus*		
Trap Type	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
JT,TML	0.00	2.79	2.79	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00
IPMT, NU+B	2.67	1.03	3.70	0.04	0.01	0.05	0.63	0.24	0.87	0.05	0.03	0.08
IPMT, FA-3, water	3.65	1.69	5.34	0.04	0.03	0.07	0.61	0.44	1.05	0.01	0.02	0.03
IPMT, FA-3, DDVP	5.81	2.52	8.33	0.08	0.07	0.15	0.80	0.27	1.06	0.03	0.02	0.05
Tephri, FA- 3, DDVP	2.46	1.20	3.66	0.01	0.00	0.01	0.07	0.02	0.09	0.00	0.00	0.00
Tephri , FA-3, DDVP, water	0.88	0.45	1.33	0.01	0.00	0.01	0.03	0.02	0.05	0.00	0.00	0.00
CC, FA-3, DDVP	0.33	0.14	0.46	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00

TABLE VIII. CAPTURE OF DIFFERENT FRUIT FLY SPECIES (IN F/T/D) IN PHASE IV EXPERIMENT AT POINTE AUX SABLES

	C. rosa			*B. zonata*			*B. cucurbitae*			*D. ciliatus*		
Trap Type	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
JT, TML	0.000	0.536	0.536	0.000	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000
IPMT, NU+B	0.425	0.211	0.636	0.336	0.064	0.400	0.107	0.071	0.179	0.004	0.000	0.004
IPMT, FA-3, water	0.804	0.393	1.196	0.918	0.271	1.189	0.093	0.050	0.143	0.000	0.004	0.004
IPMT, FA-3, DDVP	0.429	0.307	0.736	0.407	0.214	0.621	0.021	0.032	0.054	0.000	0.000	0.000
Tephri, FA- 3, DDVP	0.179	0.204	0.382	0.150	0.075	0.225	0.007	0.014	0.021	0.000	0.000	0.000
Tephri, FA-3, DDVP, water	0.225	0.225	0.450	0.257	0.100	0.357	0.007	0.046	0.054	0.000	0.000	0.000
CC, FA-3, DDVP	0.079	0.064	0.143	0.032	0.000	0.032	0.004	0.021	0.025	0.000	0.000	0.000

TABLE IX. ANALYSIS OF VARIANCE FOR EFFECTIVENESS OF TRAPPING SYSTEMS FOR FEMALE MEDFLY - PHASE III, POINTE AUX SABLES

	DF	SS	MS	F	Tab F
Block	4	0.288	0.072	1.992	3.86
Treatment	6	1.418	0.236	6.544	3.86
Error	24	0.867	0.036		
Total	34	2.572			
S.E..	0.085		S.E.D..=	0.134	

TABLE X. ANALYSIS OF VARIANCE FOR EFFECTIVENESS OF TRAPPING SYSTEMS FOR FEMALE MEDFLY - PHASE III, BEL OMBRE

	DF	SS	MS	F	Tab F
Block	4	1.299	0.325	4.480	3.86
Treatment	6	2.414	0.402	5.547	3.86
Error	24	1.740	0.073		
Total	34	5.453			
S.E.	0.120		S.E.D.=	0.190	

TABLE XI. ANALYSIS OF VARIANCE FOR EFFECTIVENESS OF TRAPPING SYSTEMS FOR FEMALE MEDFLY - PHASE IV, BEL OMBRE

	DF	SS	MS	F	Tab F
Block	4	0.493	0.123	1.956	3.86
Treatment	5	4.906	0.981	15.574	3.86
Error	20	1.260	0.063		
Total	29	6.660			
S.E.	0.112		S.E.D.=	0.177	

TABLE XII. ANALYSIS OF VARIANCE FOR EFFECTIVENESS OF TRAPPING SYSTEMS FOR FEMALE MEDFLY - PHASE IV, POINTE AUX SABLES

	DF	SS	MS	F	Tab F
Block	4	0.765	0.191	1.763	3.86
Treatment	5	4.737	0.947	8.735	3.86
Error	20	2.169	0.108		
Total	29	7.672			
S.E.	0.147		S.E.D.=	0.233	

TABLE XIII. MATURITY OF CAPTURED FEMALE MEDFLIES - POINTE AUX SABLES (SITE 1)

Date	IPMT, NU+B		IPMT, water[1]		IPMT, DDVP[1]		Tephri, DDVP[1]		Tephri, water,DDVP[1]		CC, DDVP[1]	
	Mature	Immature	Mature	Immature	Mature	Immature	Mature	Immature	Mature	Immature	Mature	Immature
24/10/97 – 30/10/97	14	10	15	9	10	8	9	4	18	11	3	1
31/11/97 – 06/11/97	20	11	3	2	17	8	17	8	16	9	2	1
07/11/97 – 13/11/97	18	10	17	14	16	9	4	2	4	3	5	2
14/11/97 – 20/11/97	20	5	13	8	15	10	1	0	5	3	0	0
21/11/97 – 27/11/97	10	7	9	8	4	2	8	5	8	4	0	0
28/12/97 – 04/12/97	6	3	5	2	7	7	8	4	16	2	2	0
05/12/97 – 11/12/97	5	2	2	1	6	3	2	2	1	0	0	0
12/12/97 – 18/12/97	5	3	4	2	14	10	1	0	0	1	0	0
Percentage	65.8	34.2	59.7	40.3	61.0	39.0	66.7	33.3	67.3	32.7	75.0	25.0

[1] FA-3 lure used as bait

TABLE XIV. MATURITY OF CAPTURED FEMALE MEDFLIES - BEL OMBRE (SITE 2)

Date	IPMT, NU+B		IPMT, water[1]		IPMT, DDVP[1]		Tephri, DDVP[1]		Tephri, water,DDVP[1]		CC, DDVP[1]	
	Mature	Immature	Mature	Immature	Mature	Immature	Mature	Immature	Mature	Immature	Mature	Immature
07/01/98 - 13/01/98	4	3	9	7	8	2	2	1	0	0	1	1
14/01/98 - 20/01/98	6	3	17	12	3	2	0	0	0	0	2	0
21/01/98 - 27/01/98	7	2	4	2	4	2	3	0	0	0	0	0
28/01/98 - 02/02/98	3	1	18	11	9	7	3	0	1	0	0	0
03/02/98 - 09/02/98	5	2	3	2	8	4	2	0	1	0	0	0
10/02/98 - 16/02/98	2	0	2	0	1	1	0	0	1	0	0	0
17/02/98 - 23/02/98	0	0	0	0	0	0	0	0	0	0	0	0
24/01/98 - 02/03/98	1	0	2	0	4	1	0	0	0	0	0	0
Percentage	71.8	28.2	61.8	38.2	66.1	33.9	90.9	9.1	100.0	0.0	75.0	25.0

[1] FA-3 lure used as bait

TABLE XV. FRUIT INFESTATION DATA (PHASE III)

No. of larvae/kg. of fruit

	C. capitata		*C. rosa*		*B. zonata*	
	Pte. Aux Sables	Bel Ombre	Pte. Aux Sables	Bel Ombre	Pte. Aux Sables	Bel Ombre
Indian Almond	3.2	2.6	26.8	8.3	55.7	6.9
Mango	Nil	Nil	Nil	8.5	Nil	17.3
Guava	-	-	-	-	-	-

TABLE XVI. FRUIT INFESTATION DATA (PHASE IV)

No. of larvae/kg. of fruit

	C. capitata		*C. rosa*		*B. zonata*	
	Pte. Aux Sables	Bel Ombre	Pte. Aux Sables	Bel Ombre	Pte. Aux Sables	Bel Ombre
Indian Almond	11.3	6.7	14.5	130	104.1	33.3
Mango	Nil	Nil	Nil	Nil	16.5	Nil
Guava	-	-	28.6	-	374.3	-

3.2. Capture of other fruit fly species

Sufficiently large numbers of females of the other ceratitid species, *C. rosa*, were caught in CC, FA-3 traps site one, and in OBDT, FA-3 at the second site. However, at Site 1, catches in IPMT, NU+B were significantly higher. Regarding *B. zonata*, *B. cucurbitae* and *D. ciliatus*, female catches in FA-3 baited traps were generally low as compared to IPMT, NU+B.

3.3. Maturity of captured medflies

Results for Phase IV are given in Tables XIII and XIV. At both sites, percentage of mature females captured was higher than immature ones.

3.4. Fruit infestation

Fruit infestation data are given in Table XV and XVI. Fruit infestation by medfly was quite low during the period of experimentation. For Phase III, 3.2 and 2.6 medfly larvae were reared per kg of Indian almond fruits at Pointe aux Sables and Bel Ombre, respectively. For Phase IV, an average of 6.7 and 11.3 medfly larvae were obtained per kg of Indian almond fruits from Bel Ombre and Pointe aux Sables, respectively.

Infestation by other fruit fly species was higher than for medfly

4. CONCLUSION

In general, the FA-3 combination showed good attractancy for female medflies. The trapping system using IPMT proved to be superior to the Tephri trap. The FA-3 combination, however, did not perform significantly better than IPMT, NU+B. Consequently, the numbers of female medflies trapped were not sufficiently high to justify the use of the FA-3 as part of

suppression programmes. Nevertheless, it provides an additional tool for monitoring medfly populations.

It is probable that the medfly populations during the experimentation were too low for results to be fully conclusive.

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