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DOSE OF CUE- LURE FOR SUPPRESSION OF MELON FLY POPULATION IN PUMPKIN

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ABSRACT

Patel Fruit fly Trap (PFT) having Nuwood block (50 x 50 x 08 mm) impregnated with different doses (0.05, 0.10, 0.15, 0.20 and 0.25 ml) of Cue-lure were tested in pumpkin field to decide the optimum dose to suppress population of melon fly, *Bactrocera cucurbitae* in cucurbit crops. 0.25 ml dose of Cue-lure remained active for 32 weeks while, the remaining doses attracted male flies up to 30 weeks. The cost of different treatments was computed to be Rs.12.92, 14.42, 15.92, 17.42 and 18.92 per treatment of 0.05, 0.10, 0.15, 0.20 and 0.25 ml of Cue-lure, respectively. It can be suggested that in long duration cucurbit crops (little gourd, parvar) and other cucurbits (gourd, melons and pumpkin) PFT (10/ha.)impregnated with 0.25 and 0.15 ml of Cue-lure, respectively are suitable for effective and eco-friendly suppression of melon fly, *B. cucurbitae* population.

KEY WORDS *:* PFT, Nuwood block, cucurbits, Melon fly, Cue-lure

INTRODUCTION

Melon fly, *Bacrocera cucurbitae* Coquillett is a important constraint for successful cultivation of cucurbit crops including pumpkin. The cultivated and wild cucurbitaceous plants are considered its preferred hosts. The female fruit fly deposits its eggs, preferably under rind of young, tender and green fruits or some times in the corolla of the flowers and maggots emerged out feed on the pulp of the developing fruit (Chaudhary, 2006). As a result of the recent efforts, made by the

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environmental protection Agency, to reduce the use of harmful insecticides, especially, organophosphonates, organochlorines, some carbamates and pyrethrides in agricultural crops, the trend has now been shifted towards an Integrated Pest Management for the management of tephritid fruit flies (Klungess *et al*., 2005). The menace of this notorious pest can be managed or suppressed in the fields involving the integration of various management tactics, including bagging of fruits, field sanitation, use of resistant genotypes, augmentation of bio control agents, cover spray of soft insecticides and use of MAT (Male Annihilation Technique) and BAT (Bait Application Technique) method. Cucurbit growers of the Gujarat state mainly over reliance on chemical methods applying injudicious and frequent spray of insecticides which causes many health problem to the final consumers.MAT is an eco-friendly tool for suppression of melon fly, *B.* cucurbitae but, the work on actual dose (quantity in ml) of Clu-lure required to impregnate Patel Fruit fly Trap and duration of installment was lacking hence, the study was undertaken.

MATERIALS AND METHODS

Cue-lure is a sex attractant for melon fly, *B. cucurbitae*. To determine the effective dose of Cue-lure to impregnate the Patel Fruit fly Trap (Patel and Patel,1996, Plate I) different doses *viz.,* 0.05, 0.10, 0.15, 0.20 and 0.25 ml were applied on Nuwood block (50 mm length x 50 mm breadth x 08 mm thickness) and placed in the Patel Fruit fly Trap. The blocks were fixed in side the lower side of the trap with two -way adhesive gum tap. The experimental site was selected on farmer's field at village : Hasanpur, Ta. vadgam, Di. Banaskantha, Gujarat, India. The traps were installed in pumpkin (Variety: *Katakiya*) field keeping minimum 20 m apart starting from the flowering stage during *rabi* and followed by summer, 2003 and 2004. 10 traps were installed in one ha. area. The treatments were replicated four times. Number of fruit flies entrapped in traps impregnated with different doses of Cue-lure were recorded at week interval by collecting them in polyethylene bag. The data obtained were subjected to statistical analysis. The effective dose was worked out on the basis of number of male flies caught. The duration of effectiveness of different doses was also recorded.

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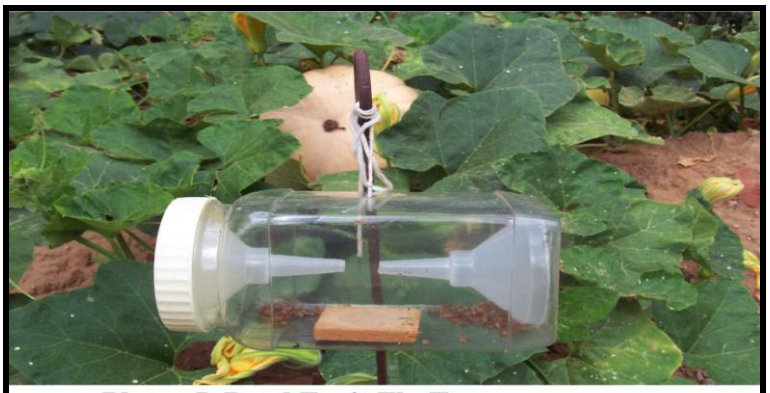

Plate - I. Patel Fruit Fly Trap

RESULTS AND DISCUSSION

Field experiment was conducted to work out effective dose of Cue-lure to impregnate PFT to attract the male of *B. cucurbitae* during *rabi* and summer season of the year 2003 and 2004 on farmer's pumpkin field. The doses of Cue-lure *viz.,* 0.05 ml, 0.10 ml, 0.15 ml, 0.20 ml and 0.25 ml were applied on 50 x 50 x 08 mm Nuwood block and kept in Patel Fruit fly Trap. Numbers of males of *B. cucurbitae* trapped in trap impregnated with various doses were recorded at week interval till the trapping was observed. The results pertaining to number of males trapped to different doses during two years (Table 1 & Fig. 1) revealed significant difference in attraction of males of *B. cucurbitae* to different doses of Cue-lure during both the years and in pooled results too. During the year 2003, maximum males of *B. cucurbitae* were attracted to 0.25 ml dose (1461 males) followed by 0.20 ml (891 males), 0.15 ml (704 males) and 0.10 ml (499 males). However, fly catches were at par in the dose of 0.20 ml with that of 0.15 ml, 0.15 ml dose with 0.10 ml and 0.10 ml with 0.05 ml dose that recorded minimum number of catches *i.e.,* 347. During the year 2004, more or less similar trend was observed in attraction of males of *B. cucurbitae* to various doses of Cue-lure like that found in previous year. The trap having 0.25 ml of Cue-lure attracted maximum number of male flies (2360), which was followed by 0.20 ml dose (1417 males), however, the later was at par with dose of 0.15 ml (1264 males). Further the dose of 0.15 ml was also at par with 0.10 ml dose (1198 males), while the 0.05 ml dose attracted minimum number of *B. cucurbitae* males *i.e.,* 617. Pooled results also indicated similar trend of attraction of male flies of *B.*

cucurbitae towards different doses of Cue-lure. Significantly highest numbers of male flies were attracted to Nuwood block impregnated with 0.25 ml Cue-lure (1883 males) followed by 0.20 ml dose (1139 males) however, the later dose was at par with the dose of 0.15 m (964 males). The dose of 0.15 ml and 0.10 ml (811 males) were at par with regards to their effectiveness to attract the males of *B. cucurbitae*. The dose of 0.05 ml attracted minimum number of *B. cucurbitae* males *i.e.,* 473. The interaction of Y x T was non-significant indicating consistency of the efficacy of various treatments over period.

From the overall discussion, it can be concluded that higher dose of Cue-lure attracted greater number of male flies of *B. cucurbitae*. In past, the higher attraction of male of *B. cucurbitae* was recorded with higher dose of Cue-lure by Cunningham and Steiner, 1992 and Anon., 2005. The descending order of attractiveness of various doses of Cue-lure was 0.25 ml > 0.20 ml > 0.15 ml > 0.10 ml and >0.05 ml. During the study, it was observed that the highest dose (0.25 ml) of Cue-lure remained active for 32 weeks and also attracted maximum number of male flies of *B. cucurbitae*. While the remaining doses attracted male flies up to 30 weeks. The cost of different treatments (Table 1) calculated on the basis of price of Patel Fruit fly Trap, Nuwood block and quantity (ml) of Cue-lure used was computed to be Rs.12.92, 14.42, 15.92, 17.42 and 18.92 per trap for the treatment of 0.05, 0.10, 0.15, 0.20 and 0.25 ml of Cue-lure, respectively. From above results, it can be suggested that in long duration cucurbits (little gourd and parvar), PFT impregnated with 0.25 ml of Cue-lure is advised while, for other gourds, melons and pumpkin , the PFT impregnated with with 0.15 ml of Cue-lure is suitable for eco-friendly entrapping of male melon fly.

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Table 1. Number of males of *B. cucurbitae* attracted to different doses of Cue-lure

Sr. No.	Treatments (Quantity)	Number of males attracted[1]			Treatment cost[2] (₹)
		2003	2004	Pooled	
1.	0.05 ml	18.63*(347)	24.85(617)	21.74(473)	12.92
2.	0.10 ml	22.34(499)	34.61(1198)	28.48(811)	14.42
3.	0.15 ml	26.54(704)	35.56(1264)	31.05(964)	15.92
4.	0.20 ml	29.85(891)	37.64(1417)	33.75(1139)	17.42
5.	0.25 ml	38.22(1461)	48.58(2360)	43.40(1883)	18.92
	S.Em. ± T	1.86	0.85	1.05	
	Y x T	-	-	1.45	
	C. D.at 5 % T	5.74	2.63	3.03	
	Y x T	-	-	NS	
	C. V. %	13.75	4.71	9.15	

1 Total of 33 observations.

2 Includes cost of Patel Fruit fly Trap + Nuwood block + Cue-lure

* Figures are $\sqrt{X + 0.5}$ transformed values, while those in parentheses are retransformed values.