GAU Res. J. 1995, 21 (1) : 137-141

Efficacy of Modified Trap Over Conventional Trap in Trapping Fruit Flies in Sapota Orchard in South Gujarat

R. K. Patel* and C. B. Patel

Department of Entomology, N. M. College of Agriculture, Gujarat Agricultural University, Navsari-396 450

ABSTRACT

Efficacy of a modified trap (methyl eugenol alone) with the conventional bait trap (methyl eugenol + DDVP) for trapping the fruit flies in sapota orchard was studied under South Gujarat conditions. The two years (1991-1992) pooled results established that the modified trap, designated as "Patel fruit fly trap" proved to be equally effective in trapping the flies without extra cost in sapota orchard. The trap involves no use of insecticide. So, it is ecofriendly and can be conveniently fitted in the module of the organic farming High (125 to 614) number of flies were caught from April to October.

(Received on 14th March, 1995)

INTRODUCTION

Fruit flies, Bactrocera Spp. (Tephritidae : Diptera) find most tropical fruits including sapota equally attractive which produce a two fold problem. For buyer, its infestation results in a one time loss but for producer it imposes a recurring loss; i.e. a loss of good wills and as such the buyer quickly switch more reliable supplier. The countries like the United States, Japan and Australia which are warm enough for fruit fly establishment, impose quarantine restrictions on import of whole fruits that may carry new fruit flies into their countries. Secondly, fumigation with ethylene dibromide to kill hidden infestation if any in whole fruits, is now virtually unacceptable bacause of strong public opinion against residue hazards. Under these circumstances, other methods that minimize chemical hazards and guarantee a pest free consignment of fruits are to be developed. The bait traps containing methyl eugenol alongwith insecticide are found to be useful in reducing the inensity of infestation (Patel, 1989). The fruit flies that were trapped could easily escape in short time in absence of the killing substance. Looking to the trend of reducing pesticide usage, it was felt necessary to modify the existing fruit fly trap into ecofriendly trap in such a way that it will require only the lure, i.e. methyl eugenol. The fruit fly species, *Dacus zonata* (Saunders) and *Dacus dorsalis*(Hendel) were observed to be attracted towards methyl eugenol (Gupta *et al.*, 1990). The results of the studies on the efficacy of the modified version with the conventional fruit fly trap are discussed in this paper.

*Present address : Assistant Professor, Department of Entomology, C. P. College of Agriculture, Sardar Krushinagar-385 506.

19

MATERIALS AND METHODS

Design of fruit fly trap

1. The conventional trap : The trap (Figure 1) consisted of plastic jar measuring 11 cm diameter; 20 cm height having a circular hole of 3 cm diameter on each on lid and bottom of the jar. It was provided with a metal hook through which the trap can be hanged in horizontal position. To attract and kill the flies the cotton swab impregnated with five drops of methyl eugenol and three drops of DDVP was placed in glass petri dish (5.5 cm diameter; 1.5 cm height) to avoid adverse effects on plastic jar.

2. The modified trap (Patel fruit fly trap) : The trap was prepared by cementing a plastic funnel of 7.5 cm diameter with a tubuler passage of 2.5 cm length and 0.7 cm internal diameter, one each on inner side of lid as well as bottom. The funnel were fixed inside the body of jar using a synthetic resin fevicol (Figure 2). This trap was baited with cotton swab impregnated with only methyl eugenol. The tubular passage of funnels allowed the flies to enter, but prevented their escape and as such the trapped male flies died subsequently without pesticide in about 1 to 2 days.

Both types of traps were installed 20 m. apart in a sapota orchard at Horticulture farm of

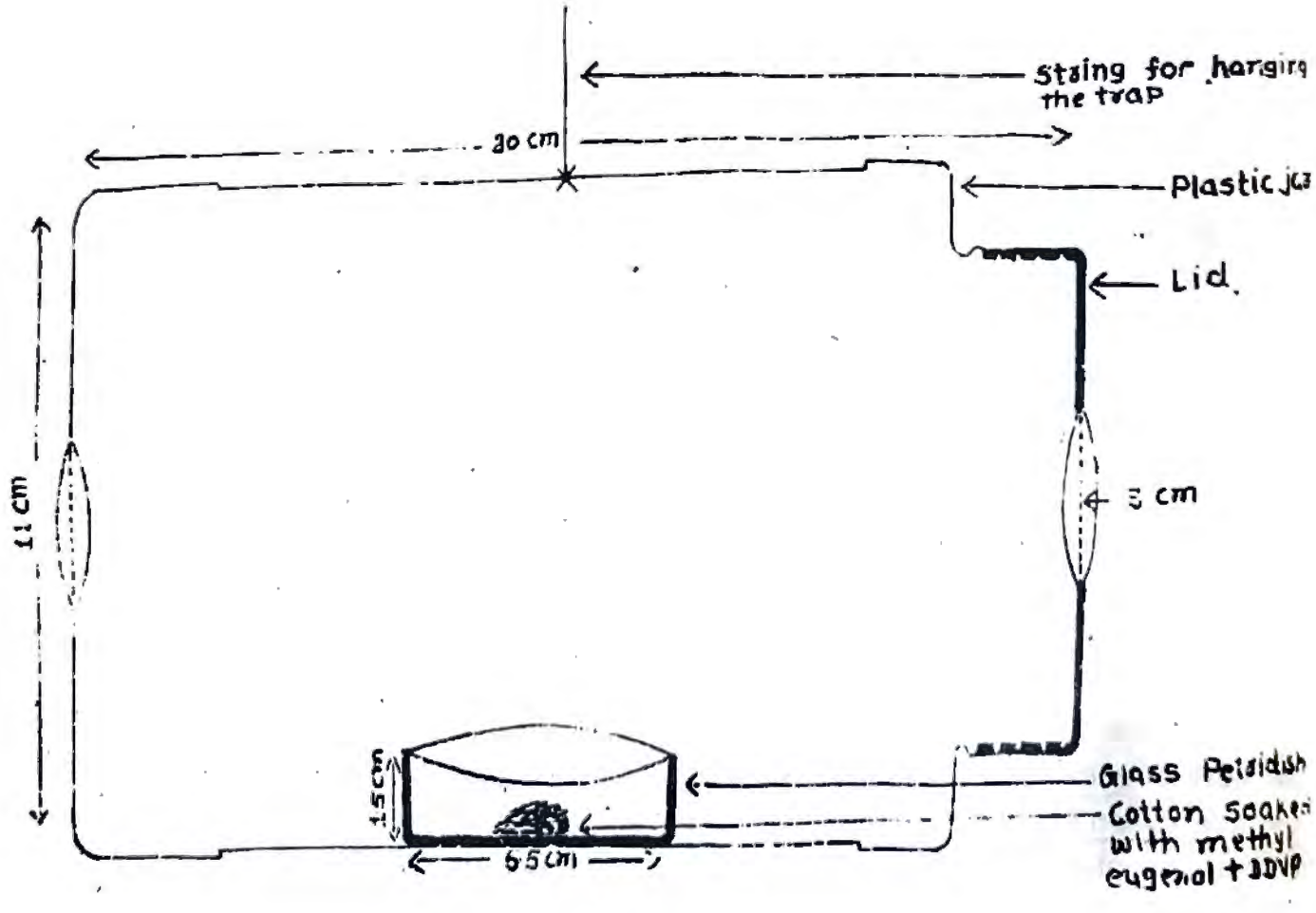


Fig. 1. : Conventional Trap

ANAND CAMPUS

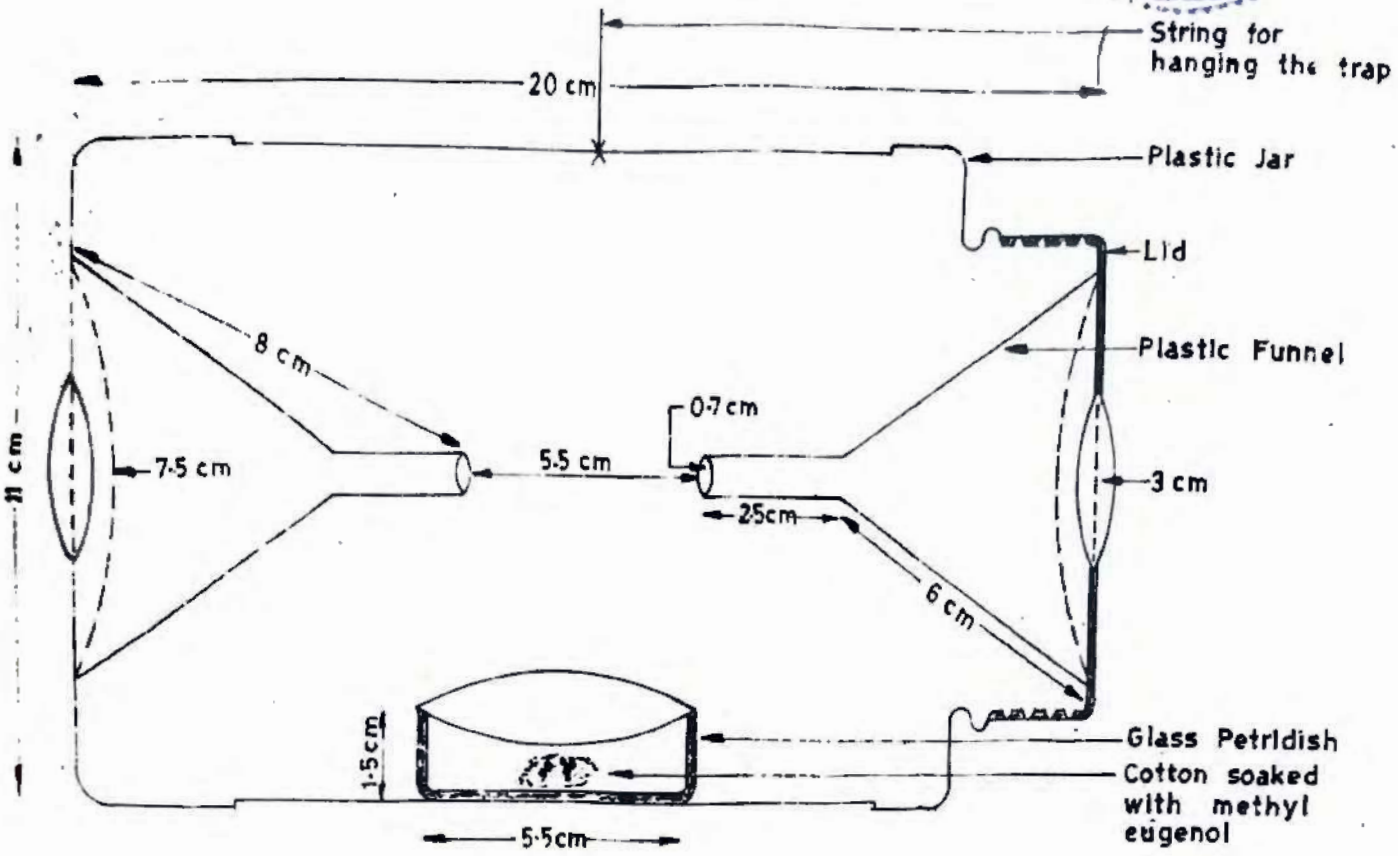


Fig. 2. : Modified Trap

N. M. College of Agriculture, Gujarat Agricultural University, Navsari during November, 1991 to October, 1993.

Observations on number of fruit flies trapped in each trap were recorded weekly. The dead fruit flies were collected and counted separately for each trap. The traps were changed every week with a mixture of lure + pesticide or lure alone as the case may be. The efficacy of the traps were judged on the basis of number of fruit flies trapped during the period of study.

RESULTS AND DISCUSSION

The data obtained on number of fruit flies trapped in conventional fruit fly trap (methyl eugenol + DDVP) and modified fruit fly trap (methyl eugenol alone) are presented in Table 1.

The fly catches in the both types of traps showed more or less similar trend during the year 1991-92 and 1992-93 (Table 1). The total number of fruit flies trapped in conventional trap was little more (2359 to 2631 flies) as compared to that found in modified trap (2345 to 2591 flies). However, the statistical analysis ruled out significant differences between these two traps.

Pooled analysis of the flies catches of both the years (Table 1) showed that 2495 and 2468 fruit flies were trapped in conventional and modified traps, respectively. The paired 't' test indicated that the difference observed in fly

TABLE 1

Comparative efficacy of conventional and modified trap for trapping male fruit flies in sapota orchard.

Sr. No.	Months	Total* No. of fruit flies trapped/trap					
		1991-92**		1992-93**		Pooled**	
		Conventional trap (Me + DDVP)	Modified trap (ME)	Conventional trap (ME + DDVP)	Modifield trap (ME)	Conventional trap (ME + DDVP)	Modified trap (ME)
1.	2.	3.	4.	5.	6.	7.	8.
1.	Nov.	8	12	10	17	9.0	14.5
2.	Dec.	8	7	5	13	6.5	10.0
3.	Jan.	28	14	22	16	25.0	15.0
4.	Feb.	41	54	48	44	44.5	49.0
5.	Mar.	139	118	145	147	142.0	132.5
6.	Apr.	564	581	663	651	613.5	616.0
7.	May.	207	191	335	325	271.0	258.0
8.	Jun.	358	316	500	494	429.0	405.0
9.	Jul.	609	594	521	528	565.0	561.0
10.	Aug.	227	255	213	180	220.0	217.5
11.	Sep.	132	152	117	131	124.5	141.5
12.	Oct.	38	51	52	45	45.0	48.0
	Total	2359	2345	2631	2591	2495	2468
Std. error of diff.		5.96		3.59		2.94	
Mean of diff.		1.17		3.33		1.42	
Value of Cal. 't'		0.20		0.93		0.48	
Value of table 't'		2.20		2.20		2.20	
Conclusion		N.S.		N.S.		N.S.	

* Total of 4 weeks

** Paired 't' test

M.E. = Methyl eugenol

N.S. = Non significant

catches between conventional and modified trap was non significant. This indicated that there was no significant difference in fly trapping ability of the conventional and modified traps under test. The number of flies caught/trap ranged from 6.5 to 614 (Table 1). Subsequently high (125 to 614) number of flies caught from April to September.

Thus, the overall results clearly indicated that the modified trap has parallel potential to conventional one. One the other hand, the modified trap can be conveniently fitted in the module of organic farming since it eliminate the use of chemical pesticide. From the economic point of view, the cost of modification can be compensated against the cost of pesticide to be charged at every week in conventional trap.

In other countries, steinar trap (Queensland modification) is in use which require lure + chemical pesticide. Its two entry holes were provided with a small plastic tube having diameter equal to that of entry hole. The entry hole is covered to half size by a piece of metalic wire gauze (Drew, 1982). Although, this mechanism helps to reduce the chances of fly escape to some extent, it require chemical impregnation to kill the trapped flies. Whereas, the modified trap ensures killing of trapped flies by preventing their escape and thus proved to be superior than the existing models.

Summary and Conclusion

The overall results indicated that the modified trap hes equal fly catching potential to that in the conventional trap. Former has additional benefit of ecofriendly usage without extra cost. The modified trap could be designated as " Patel Fruit Fly Trap" and is recommended on large scale to the fruit and vegetable growers to reduce the fruit fly problem.

REFERENCES

Drew, R. A. I. (1982). Fruit fly collection In :*Economic fruit flies of the South Pacific Region*, 2nd ed. (Drew, R. A. I., Hopper, G. H. S. and Bateman, M. A., eds), Brisbane PP. 129-139.

Gupta, D.; Verma, A. K. and Bhalla, O. P. (1990). Population of fruit flies *Dacus zonatus* andDacus *dorsalis*) infesting fruit crops in Northern Western Himalayan region. *Indian J. Agric. Sci.*, **60**(7) : 471-474.

Patel, N. V. (1989). Biology of fruit fly, *Dacus cucurbitae* (Coq.) on cucurbits and its chemical control on bitter gourd. M. Sc. (Agri.) thesis sibmitted to Gujarat Agricultural University, Sardar Krushinagar (Unpublished).