

Discussion

P. H. LIAO: Have DBM pheromones been used in practice in the program to control DBM in Taiwan?

Y. S. CHOW: No, we have not used the sex pheromone of female DBM alone in the field. But when the monitoring pheromone trap was combined with insecticide use, it did help the farmer to decrease the cost of insecticides. It reduced the number of insecticide sprays in the field.

P. H. LIAO: Have you conducted any field experiment to evaluate the practical value of DBM pheromones?

Y. S. CHOW: As I mentioned above, it is only practical when the sex pheromone is used as a survey tool. We also studied the effective distance of the female sex pheromone, and its effective distance is only one meter.

A. SIVAPRAGASAM: One major problem in the use of pheromone for pest control is that it is not effective as a monitoring tool at high population densities, when high natural female pheromone release would affect the artificial one from the trap.

Y. S. CHOW: Yes, I agree.

P. A. C. OOI: Are sex pheromones specific to species? I notice that in the traps you used other microlepidoptera were attracted.

Y. S. CHOW: In general, the sex pheromone is rather species specific. However, there are some cases where certain pheromone chemicals attract more than one species. Please refer to Roelofs, W. L. 1978. *J. Chem. Ecol.* 4:685-699 and Yamada, H. and T. Koshihara. 1980. *Kontyu, Tokyo.* 48(1):104- 110.

P. A. C. OOI: Can the DBM sex pheromone be used to disorientate the males and contribute to pest control?

Y. S. CHOW: Yes, the DBM sex pheromone could be used to disorientate the males over a short distance. However, we will need higher concentrations of the chemicals to make DBM control more extensive.

R. S. REJESUS: Is there resistance to pheromone in DBM?

C. J. W. MAA: I do not have definite data to make a valid conclusion to this effect.

N. S. TALEKAR: At AVRDC we find two to three shades of color in DBM. They could be different strains of DBM. Is it possible that the differences you are finding could be due to differences in strains or proportions of the strains at a particular location, rather than to insecticide resistance.

C. J. W. MAA: Naturally, a heterozygote gene pool of an insect population is likely to be present in the field. Topical treatment of malathion on larvae of the first generation of two different breeds of I-lan population shows a three to four fold difference in LT_{50} . The variation in shades of color of DBM found at AVRDC could be due to genetic diversity of individual insects in that population. I personally also noticed this phenomenon in DBM at various sites around Taiwan. When I did the Y-test I used several hundred males for it. It is a sizable sampling. I noticed the difference in male response to the pheromone, although the difference was statistically insignificant. There is no evidence yet whether this is due to insecticide resistance. Nevertheless, variation of the

antennal esterase shown in the zymogram and biochemical properties of these enzymes might reflect that there is a potential for variation in pheromone response bestowed on the different insect populations.