POSTER SUMMARY

TOWARDS DEVELOPING A MODIFIED DELTA TRAP TO MONITOR *ELDANA SACCHARINA* (LEPIDOPTERA: PYRALIDAE)

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Abstract

Eldana saccharina Walker (Lepidoptera: Pyralidae) moths can be monitored in sugarcane using a modified Robinson light trap but there are several shortcomings associated with this particular technique. Amongst these are the necessity for a power source and the non-selectivity of the catch. There is ongoing research at SASRI towards developing a pheromone trap for this major pest. In field trials the standard white or yellow Delta™ insect trap was recently tested with and without crude pheromone lures made from excised abdomens of laboratory bred *E. saccharina* males. In addition, because it has been known by entomologists for many years that catch in light traps are considerably higher near the period of new moon than near full moon, the performance of white and yellow standard traps and specially modified white and yellow reflective traps, was tested in relation to lunar periodicity. Delta traps would be suitable to use in sugarcane. Specific features rendering this trap particularly suitable include: readily available commercially (www.insectscience.co.za); small and portable (110 x 200 x 280 mm); made from coryx (plastic) which is durable and resistant to the vagaries of the weather; a wire attachment on the top allows the trap to be set at canopy height, and a sticky liner within the trap retains the catch for easy counting.

Keywords: sugarcane, *Eldana saccharina*, Pyralidae, monitoring, Delta traps, pheromones

Introduction

A pheromone trapping system is required as a practical tool for monitoring presence/absence, population abundance, geographical distribution, and moth flight activity of *Eldana saccharina* Walker (Lepidoptera: Pyralidae) (Way, 2000). Also, a pheromone trap for *E. saccharina* is required to complement field scouting as for *Chilo sacchariphagus* (Lepidoptera: Crambidae) (Way *et al.*, 2004)

Pheromone traps are particularly suitable because they are easy to install and no power source is required, the traps operate in remote regions in the absence of a collector and under any weather condition, and the traps are robust and relatively cheap. Moreover, these traps do not require regular servicing as do light traps, and there is no need to sort the catch because the lure is species-specific. Lastly, pheromone traps are effective monitoring tools that can be used even during periods of low pest numbers.

Muirhead-Thompson (1991) documents aspects regarding pheromone trapping systems to consider such as the type of lure or bait to employ; trap placement within the crop; and trap orientation. Other aspects include trap design and in this study the Delta (D-trap) design was selected for testing because this design is available commercially (www.insectscience.co.za); it is a small (110 x 200 x 280 mm), portable and durable device made from coryx, which is a tough synthetic plastic product. A wire attachment is provided with each trap as well as a sticky liner for the bottom of the trap.

In this poster we describe the experimental method used to test the performance of the D-trap, and provide preliminary results that indicate merit in conducting additional experiments to test critical permutations of the trapping system.

Method

The standard white D-trap and the same trap treated on the outside surface with luminescent paint were assessed in sugarcane within a normal field cage (80% shade net: 2.65 x 2.50 x 2.52 m). Experiments were purposely carried out during the new moon phase period since Williams and Singh (1951) report that insect catches in light traps are considerably higher over this period. A series of experiments were conducted, usually testing five traps at a time, and in total 30 traps were assessed to study this particular aspect. A single lure, made crudely by smearing abdomens of 10 laboratory-reared males (Graham and Conlong, 1988) onto filter paper, was placed in each trap. Control traps were run concurrently with the baited traps. These lures were evaluated by operating traps without them. Traps were sited at canopy height, where groups (leks) of feral males release pheromones to attract mates (Atkinson, 1980), and orientated with open ends facing predominant wind direction. As mentioned by Muirhead-Thompson (1991) effective pheromone traps attract individuals with the lure and then retain catches for counting purposes. D-traps have a well designed sticky printed sheet in the bottom of the trap for the latter purpose. After five days the efficacy of traps are assessed as the percentage catch of those moths released into the cage. The released moths are all freshly eclosed newly emerged, and unmated females reared in the laboratory.

Results and Discussion

White traps treated with luminescent substance resulted in a significant increase in catch numbers from an overall average of 8.7±1.2 moths/trap in untreated traps to 14.8±2.3 moths/trap in treated traps, or by 58.8%. In 18 (60%) of the 30 experiments catches were higher in luminescent D-traps.

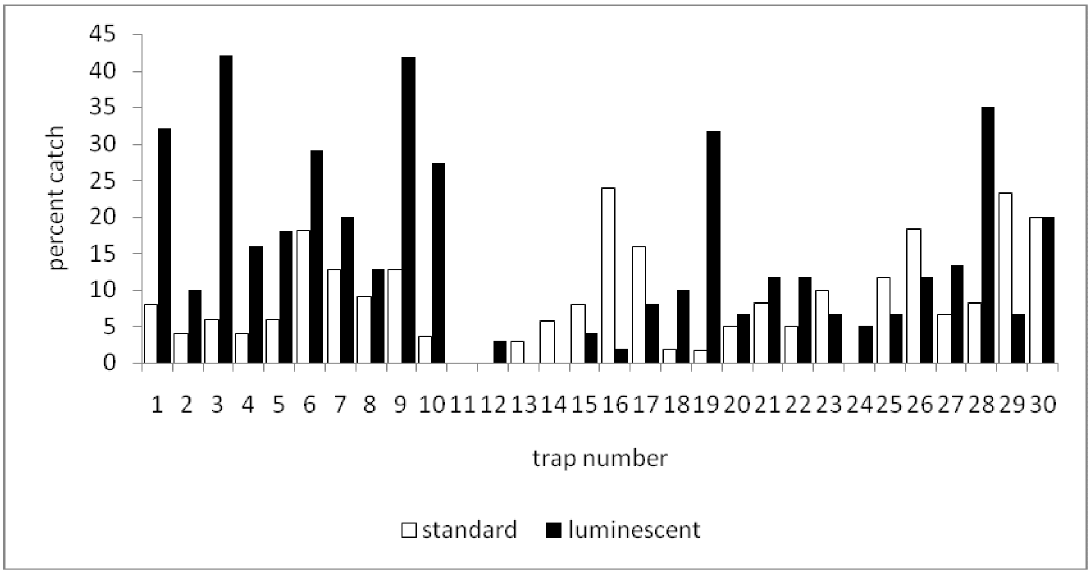

Figure 1. Percentage catch in standard Delta traps compared with traps treated with a luminescent paint.

Eight white D-traps were operated without any lure and the catch level decreased to 2.2% and 0.75% for standard and treated traps, respectively, and it was concluded that the lure is an essential component. A catch level of 12% was obtained using the yellow standard D-trap. However, given the small number of replicates (five) it is necessary to repeat these experiments before making a recommendation.

Conclusion

White Delta traps baited with crude lures made from the abdomens of fresh *E. saccharina* male moths attract and retain moths released into a normal field cage. Additional studies are required to develop a monitoring technique that will be effective in sugarcane fields.

REFERENCES

Atkinson PR (1980). On the biology, distribution and natural host plants of *Eldana saccharina* Walker (Lepidoptera: Pyralidae) *J Ent Soc S Afr* 43(2): 171-194.

Graham DY and Conlong DE (1988). Improved laboratory rearing of *Eldana saccharina* Walker (Lepidoptera: Pyralidae) and its indigenous parasitoid *Goniozus natalensis* (Hymenoptera: Bethylidae). *Proc S Afr Sug Technol Ass* 62: 116-119.

Muirhead-Thompson RC (1991). *Trap Responses of Flying Insects*. St Edmundsbury Press Ltd, Bury St Edmunds, Suffolk, London NW1 7DX, ISBN 0-12-509755-7. 287 pp.

Way MJ (2000). Towards developing a pheromone trap for *Eldana saccharina* Walker (Lepidoptera: Pyralidae). *Proc S Afr Sug Technol Ass* 74: 233 (poster).

Way MJ, Goebel FR and Conlong DE (2004). Trapping *Chilo sacchariphagus* (Lepidoptera: Crambidae) in sugarcane using synthetic pheromones. *Proc S Afr Sug Technol Ass* 78: 291-295.

Williams CB and Singh BP (1951). Effect of moonlight in insect activity. *Nature* 167: 853.