

# AN ANNOTATED CHECKLIST OF CLEARWING BORER PESTS OF ORNAMENTAL PLANTS TRAPPED USING COMMERCIALY AVAILABLE PHEROMONE LURES

by Susan M. Braxton and Michael J. Raupp

**Abstract.** Pheromone traps are recommended as monitoring tools in Integrated Pest Management (IPM) and Plant Health Care (PHC) programs for landscape plants. However, the use of pheromone traps and interpretation of trap catches can be confusing due to the diversity of species trapped. In this report we present a checklist of clearwing borer species caught in traps baited with several different commercial pheromone lures in the Maryland and Washington, D.C. area. We describe several problems associated with the identification of species and interpretation of trap catches.

Pheromones are commercially available for a broad array of insect pests of landscape plants and are recommended for use in monitoring pest activity (1,6,7,8). While application of this technology appears straightforward, the proper use of traps, and correct interpretation of trap catches, are critical to determine the accurate timing and need for control measures. McNeil (4) discussed the interpretation of pheromone trap catches with respect to ecology and behavior of target insects, and some work has been done in examining capture efficiencies of various trap types (11). Target species may differ in their response to commercial lures from region to region (10).

While the need to develop meaningful relationships between trap catches and actual field populations is clear, a more immediate need is clarification of the range of species attracted to a single pheromone lure. Many lures used in landscape IPM are marketed for specific pests, and IPM practitioners may be surprised and confused by the variety of species captured. Our experiences were substantiated by cooperating nursery and landscape managers.

A number of useful guides is available to aid in identification of selected pests of ornamentals

(3,9). Valley (12) provided a practical guide to the identification of common clearwing borers caught in sticky traps baited with pheromones. Those using traps may find it easier to identify trap catches if the species they are likely to catch are known. The purpose of this paper is to provide information on the range of clearwing borer species caught using sticky traps baited with commercially available lures.

## Materials and Methods

Lures were obtained from two major pheromone producers, Scentry™ and Trece™. Trece Pherocon 1C wing traps were used, as this trap type is in common use in commercial nurseries, landscapes, and orchards. The lures used were Trece greater peachtree borer, lesser peachtree borer, and lilac/ash borer, and Scentry dogwood borer and clearwing borer. Traps were baited and placed in several locations, including managed and unmanaged landscapes and commercial nurseries, in Maryland and Washington D.C., and were monitored approximately twice each week. Lures were replaced at regular intervals according to the recommendations of the manufacturer or supplier.

## Results and Discussion

Lures marketed for specific target species did not consistently trap those targets to the exclusion of other species. The range of species trapped by different lures used are shown in Table 1.

The attraction to all lures appeared to be fairly general, with all lures attracting at least some individuals in addition to the target species, and in addition to the target genus. Lures that attracted

**Table 1. A checklist of species trapped in Maryland using wing traps baited with commercially available pheromone lures for clearwing borers. GPTB = greater peachtree borer, LPTB=lesser peachtree borer, L/AB = lilac/ash borer, BAC = banded ash clearwing, DWB=dogwood borer, RB = rhododendron borer, OB = oak borer, MCB = maple callous borer, BGB = black gum borer, CWB = clearwing borer. (NOTE: + = species caught using lure; ? = uncertain report of species caught using lure.)**

Species	Trece		Scentry		
	GPTB	LPTB	L/AB	CWB	DWB
<b>Synanthedon</b>					
acerni (MCB)	+			+	+
exitiosa(GPTB)	+		+	+	+
pictipes (LPTB)	?	+	?	?	?
rhododendri (RB)	+		+	+	+
rubofascia (BGB)				+	
scitula (DWB)	+	+	+		+
<b>Podosesia</b>					
aureocincta (BAC)	+	+		+	
syringae (L/AB)	+		+	+	+
<b>Paranthrene</b>					
simulans (OB)	+	+	+	+	+

the greatest number of species were the Trece lilac/ash borer and the Scentry clearwing borer lures. Both captured 7 species in 3 genera. The Scentry dogwood borer lure also attracted a broad range of species. The lure with the most specific activity was the Trece lesser peachtree borer lure. This lure captured only 4 species in 3 genera. Furthermore, the total number of individuals of other species was low. The relative specificity of the lesser peachtree borer lure is not surprising. The compound (E,Z)3,13-octadecadien-1-ol acetate (EZA), which is known to attract the lesser peachtree borer, is less attractive to the other common species captured in this study (9).

Identification of species was problematic in many instances. The overlap in size ranges of the two peachtree borers often made it impossible to distinguish between them. No practical solution to this problem was found, hence there were several uncertain reports of lesser peachtree borers in all

traps (Table 1). Taft et al. (9) present characteristics useful for differentiating between peachtree borer and lesser peachtree borer. However, characteristics used in identification, such as wing coloration, are often obscured or rendered useless after insects have been caught in the trap. Also several individuals were captured that had distinct features, but which could not be identified using the commonly available guides. Without complete identification aids, the identity of these individuals remains unknown.

The number of individuals of a species caught over the season at a given location may be influenced by many factors, such as proximity of host plant to trap, weather, or natural enemies. However, our data suggest that lures marketed for a particular species may be less effective at attracting the target species than other lures at the same location. At the University of Maryland site, the Trece lilac/ash borer lure consistently trapped fewer lilac/ash borers than did the Scentry dogwood borer lure. Conversely, the Trece lilac/ash borer lure appeared to attract more dogwood borers than did the Scentry dogwood borer lure. Because the traps were approximately 50 yds. apart, it seems unlikely that difference in proximity to host plants of target species was a major factor.

At the University of Maryland site, the first flight of dogwood borers was not detected. However, individuals of the second flight were captured effectively with the Trece lilac/ash borer and dogwood borer lures, both of which were in use during the first flight period at Maryland. At the Smithsonian Institution site, the early dogwood borer flight was detected with the Scentry dogwood borer lure, and the second flight individuals were caught using the Trece lilac/ash borer and dogwood borer lures. Although there is only 1 generation of dogwood borer reported in this area (2, 3), Potter and Timmons (5) suggested that there are two distinct flight periods that may correspond to two different populations in Kentucky. Further study is needed to determine the status of this highly polyphagous (3) species which has a history of unreliable trapping in Maryland (2).

An unexpected result was the general attractiveness of the Trece lilac/ash borer and Scentry dogwood borer lures, which are marketed for

single species. Both lures caught several species of clearwing borers.

**Relevance to the industry.** Identification of species trapped is critical to a successful monitoring program. In general, the problems encountered with identification should not preclude success. In cases where identifying features of some moths are destroyed in traps, other individuals are usually present which are in good condition and can be identified. If arborists can recognize the common pest species readily, then the occasional unknown individual will not interfere with flight period monitoring. If a particular "unknown" species makes more than an incidental appearance, however, consultation with an expert is advised. Further study is needed to determine whether the lesser peachtree borer is attracted to lures marketed for other species. If so, a simple method of distinguishing this pest from close relatives particularly the greater peachtree borer should be developed for use in the field.

It is clear that the practical application of pheromones for monitoring clearwing borers can be complicated. Practitioners must be familiar with a broad range of species, and they may expect traps to capture many non-target species, and to fail to capture target species reliably. In spite of these potential stumbling blocks, however, this technology is currently being used successfully to manage pest populations in landscapes (1,8). The results presented here are meant to alert arborists to possible pitfalls associated with the use of these traps in landscape situations. Furthermore, arborists should obtain useful references such as the excellent ones by Taft et al. (9) and Valley (12) to assist in the field identification of clearwing borer species.

**Acknowledgements.** We thank the Department of Physical Plant at the University of Maryland and the Horticulture Division of the Smithsonian Institution for allowing us to gather data from their landscapes. This is Scientific Article Number A7731 Contribution Number 9052 of the Maryland Agricultural Experiment Station.

## Literature Cited

1. Ball, J. 1986. *Public perception of an integrated pest management program*. J. Arboric. 12:135-140.
2. Davidson, J.A. and M.J. Raupp. 1993. IPM recommendations for insect and mite pests identification, monitoring and control on trees and shrubs. Maryland Cooperative Extension Service, University of Maryland. 75pp.
3. Johnson, W.T. and H.H. Lyon. 1988. *Insects that Feed on Trees and Shrubs*. Cornell Univ. Press. 556 pp.
4. McNeil, J. 1991. *Behavioral ecology of pheromone-mediated communication in moths and its importance in the use of pheromone traps*. Ann. Rev. Entomol. 36:407-430.
5. Potter, D.A. and G.M. Timmons. 1983. *Flight phenology of the dogwood borer (Lepidoptera: Sesiidae) and implications for control in Cornus florida L.* J. Econ. Entomol. 76:1069-1074.
6. Raupp, M.J. 1985. *Monitoring: An essential factor to managing pests of landscape trees and shrubs*. J. Arboric. 11:349-355.
7. Raupp, M.J., C.S. Koehler and J.A. Davidson. 1992. *Advances in implementing integrated pest management for woody landscape plants*. Ann. Rev. Entomol. 37:561-585.
8. Nielsen, D.G. 1990. *Landscape integrated pest management*. J. Arboric. 16:253-259.
9. Taft, W.H., D. Smitley, and J.W. Snow. 1991. *A guide to the clearwing borers (Sesiidae) of the North Central United States*. North Central Regional Publication No. 394. 30pp.
10. Thompson, D.R., N.P.D. Angerilli, C. Vincent and A.P. Gaunce. *Evidence for regional differences in the response of obliquebanded leafroller (Lepidoptera: Tortricidae) to sex pheromone blends*. Environ. Entomol. 20(3):935-938.
11. Timmons, G.M. and D.A. Potter. 1981. *Influence of pheromone trap color on capture of lilac borer males, Podosesia syringae*. Environ. Entomol. 10(5):756-759.
12. Valley, K. 1992. *Identifying clearwing borers in pheromone traps*. Regulatory Horticulture 18:12-14.

## Entomologist

Biological Control Documentation Center

Bldg. 004, Room 2

BARC-West

Beltsville, MD 20705

and

Chair

Department of Entomology

University of Maryland

College Park, Md 20742-5575

**Résumé.** Les pièges à phéromones sont communément recommandés comme outil de suivi des populations au sein des programmes intégrés de gestion des insectes et maladies et des programmes de soins à la santé des végétaux. Néanmoins, l'utilisation des pièges à phéromones et l'interprétation de son contenu de capture peut être une tâche confuse en raison de la diversité en insectes capturés. Cet article présente une liste de contrôle des espèces de perceurs capturés dans les pièges appâtés avec divers leurres commercialisés sur le marché dans les régions du Maryland et du district de Washington. On y décrit divers problèmes associés à l'identification des espèces et à l'interprétation du contenu des pièges.

**Zusammenfassung.** Pheromonfallen werden gewöhnlich empfohlen als ein Überwachungsmittel im Integrierten Pflanzenschutz und in Pflanzengesundheitsdienstprogrammen. Trotzdem kann der Gebrauch von Pheromonfallen und die Interpretation der Falleninhalte wegen der Vielfalt der gefangenen Arten Verwirrung verursachen. In diesem Report präsentieren wir eine Checkliste von Bohrinsekten-Arten, die in Pheromonfallen mit verschiedenen kommerziellen Lockmitteln in der Gegend von Maryland und Washington, D.C. gefangen wurden. Wir beschreiben einige Probleme, die mit der Identifikation der Arten und der Interpretation der Falleninhalte verbunden sind