



# Branching out

from the Canadian Forest Service ■ Laurentian Forestry Centre

Number 40  
2007

## Using scents to trap forest insect pests

Pheromones are volatile compounds, or “scents”, that are used by insects of a given species to communicate with each other. There are various types of pheromones serving different purposes, i.e., alarm, aggregation, territorial marking, tracking or recognition, and sex pheromones. Researchers with the Canadian Forest Service (CFS) of Natural Resources Canada are currently working on isolating these pheromones, identifying their components and determining how they are used by insects.

Synthetic pheromones can be used for tracking and monitoring insect pests using traps or for controlling such pests through mass captures or mating disruption.

Tracking and monitoring forest insect pests over large areas is limited by time and cost constraints. Installing a few pheromone traps as opposed to systematically sampling trees substantially reduces the time spent on tracking and monitoring. This technique also makes it possible to increase the area covered at a lower or equivalent cost to that of traditional sampling. Tracking is used to determine whether an insect population has exceeded a critical threshold, whereas monitoring is designed to estimate the



Installation of a pheromone trap in the tree crown.  
Photo: J. Delisle



Pheromone trap.  
Photo: USDA-APHIS-PPQ

extent of the damage that the next generation of larvae could cause. Armed with this informa-

tion, researchers can determine whether phytosanitary measures are required and can select the best time for implementing such measures.

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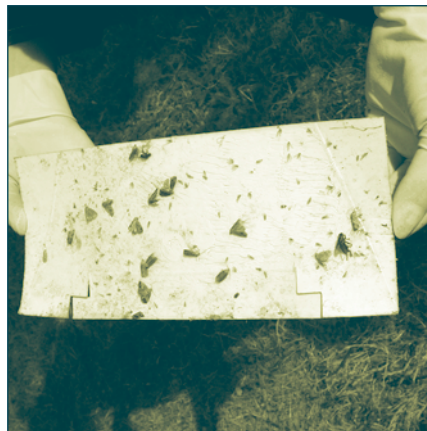


Mass capture is a control method involving the deployment of several pheromone traps to capture the largest possible number of males before the females arrive in order to disrupt mating. This control method is effective under certain conditions, such as in isolated plantations, seed orchards or urban areas. Forest areas affected by insect outbreaks are typically very extensive, which makes this technique very onerous

## Traps for all tastes

The most common types of traps are sticky traps, the capacity of which is limited to the size of the sticky surface, and large volume traps. Sticky traps are inexpensive and easy to use. Large volume traps have a receptacle containing an insecticide that kills insects that gather at the base of the trap.

Due to the specificity of pheromones, counting captured insects does not require an extensive knowledge of insect taxonomy. With their simple design and low cost, pheromone traps can play an important role in assessing the impact of climate change, contributing to the development of new strategies for the control of insect pests, and facilitating early detection of the presence of exotic pests.



Trap saturated with insects.  
Photo: J. Delisle

due to the large number of traps required, the need to install the traps in the tree canopy to maximize captures, and the need to regularly clean the traps. Finally, mating disruption is a control method that uses pheromones to manipulate insect reproductive behaviour. This technique, which does not require the use of traps, is described in No. 28 of *Branching Out*<sup>1</sup>.

## FOR MORE INFORMATION, PLEASE CONTACT:

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## Monitoring insects

Quebec has established an extensive network of 1,200 permanent stations for monitoring the most vulnerable stands in areas where recurrent outbreaks occur. Pheromone traps installed at certain stations are used to detect very small larval populations. Specialists can then predict infestations three or four years before they occur.

In 2007, the Canadian Food Inspection Agency (CFIA) used pheromone traps to detect the presence of the brown spruce longhorn beetle (BSLB), an exotic species, in Quebec and the Atlantic provinces. CFS researchers have succeeded in creating a synthetic pheromone of the male BSLB and are attempting to improve the effectiveness of pheromone traps as a BSLB tracking tool.



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1 J. Delisle, 2006. Use of the mating disruption approach: protecting trees by tricking insect pests. *Branching Out* No. 28, Canadian Forest Service – Laurentian Forestry Centre.