

**SPM 0002 IDENTIFICATION OF AN EFFECTIVE SEX PHEROMONE LURE FOR THE FIR CONEWORM, *DIORYCTRIA ABIETIVORELLA*, AND DEMONSTRATION OF ITS EFFICACY IN SEED ORCHARDS**  
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Canadian Forest Service and University of California (Riverside) researchers led work on this project with collaboration from the BC Ministry of Forests. The broad objectives of this work are to:

- determine the components of the fir coneworm pheromone
- synthesize and purify pheromone components for field testing.
- conduct trapping experiments in seed orchards in BC, California, and Quebec
- perform behavioural bioassays on live moths in the lab.

From moths reared from Douglas-fir cones, pheromone extracts were prepared and then tested through standard coupled gas chromatograph / electroantennogram detection (GC-EAD) procedures. The EAD detected only two compounds in the extracts: Z9,E11-14:Ac, and trace amounts of either Z9- or E9-14:Ac. Although the GC detected a number of other compounds in the various extracts, none of them elicited antennal responses. Thus the evidence indicates that the pheromone consists of one or possibly two components. Final resolution awaits further work planned for 2004/05.

Purification of pheromone components has been focused on the major component, Z9,E11-14:Ac. 99% chemical and isomeric purity was achieved through the use of custom made chromatography columns and associated equipment but this method proved costly and provided only tiny amounts of purified pheromone. An industrial process based on low-temperature recrystallization of derivatives was also used but none of four different derivatives methodologies produced satisfactory results. Despite this, continuation of this work is planned in the hope that this general technical and financial bottleneck can be eliminated.

Field tests of synthetic pheromone blends were conducted at Chico CA, Vernon, BC, and in Quebec during 2003. Trap catches were low in Chico and Vernon, zero in Quebec. The poor catches were not likely due to pheromone degradation or impurity. A key pheromone component may be missing or perhaps one of the physical parameters (e.g. traps design) needs to be manipulated.

A laboratory colony of coneworms has been established in Sault Ste Marie ON to provide insects for the behavioural bioassays (and further GC-EAD analysis). Continuation of this aspect of the work is expected in spring 2004.