

## Spruce Budworm

*Choristoneura fumiferana* (Clemens)

Lepidoptera: Tortricidae

Allen, D. C.; Abrahamson, L. P.; Eggen, D. A.; Lanier, G. N.; Swier, S. R.; Kelley, R. S.; Auger, M. 1986. Monitoring spruce budworm (Lepidoptera: Tortricidae) populations with pheromone-baited traps. *Environmental Entomology* 15: 152-165.

**Objective:** To develop a trapping system that would reflect *C. fumiferana* densities accurately.

**Abstract:** The spruce budworm is the most destructive defoliator of balsam fir, *Abies balsamea* (L.) Mill., and white spruce, *Picea glauca* (Moench) Voss, in eastern North America. The last three larval instars cause most of the defoliation. A collaborative study was conducted in Canada and the northeastern USA to evaluate the effectiveness of four types of pheromone traps and two types of commercial lures as a population monitoring tool.

In most locations with most traps, the catch of male *C. fumiferana* moths was correlated positively with second and fourth instar populations. Covered funnel traps (Ramaswamy and Cardé 1982) baited with Conrel lures caught significantly more male *C. fumiferana* moths than those baited with Hercon lures. A five-trap cluster placed at least 40 m from an opening with a 40-m interval between traps provided the best compromise between sampling accuracy and practicality. Although not tested here, the authors recommended field testing of the Unitrap (International Pheromones, London) and the Multi-Pher trap (Les Services Biocontrôle, Quebec) in further trapping studies because they appeared well designed for capturing *C. fumiferana* moths.

**Sampling Procedure:** This review describes the use of covered funnel traps. Please consult the original publication for the procedures used for other, less effective traps. Age Conrel pheromone lures (96:4 blend of (*E*)- and (*Z*)-11-tetradecenal plus 2% antioxidant) (Albany International, Needham Heights, Massachusetts) for 21 d prior to use to reduce trap saturation. Pin one lure in the top of each covered funnel trap (Ramaswamy and Cardé 1982). At the bottom of each trap, place a killing agent to retain moths entering the trap.

Place a trap cluster every 60-m in the area of concern, 4-7 d prior to initiation of *C. fumiferana* moth flight. Clusters should be placed >40 m from an opening (field, meadow, etc.). Place one trap in each of the north, east, south, and west aspects, 40 m from a central trap, for a total of five traps per cluster. Suspend each trap from a branch 2-2.5 m above the ground. Trim all foliage within 30 cm to create unobstructed access to incoming moths. Retrieve traps about 7 weeks later, and count the number of moths.

**Notes:** It takes 30 minutes to set up a trap cluster. One trap cluster will suffice for monitoring 20 hectares (~50 acres) of susceptible host trees.

**Reference:**

Ramaswamy, S. B.; Cardé, R. T. 1982. Nonsaturating traps and long-life attractant lures for monitoring spruce budworm males. *Journal of Economic Entomology* 75: 126-129.