

Western Hemlock Looper

Lambdina fiscellaria lugubrosa (Hulst)

Lepidoptera: Geometridae

Carolin, V. M.; Johnson, N. E.; Buffam, P. E.; McComb, D. 1964. Sampling egg populations of western hemlock looper in coastal forests. Res. Pap. PNW-14. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station; 15 p.

Objectives: To determine the best sampling unit for detecting infestations; to determine preferred locations of egg deposition on codominant western hemlock, *Tsuga heterophylla* (Raf.) Sarg., trees and on ground sites below these trees; and to determine which ground-site samples produce estimates representative of egg deposition on the tree.

Abstract: The western hemlock looper, *Lambdina fiscellaria lugubrosa* (Hulst), is a destructive defoliator that causes damage periodically to western hemlock stands and other coniferous hosts. Outbreaks occur every 11-17 years in coastal areas of the Pacific Northwest. The infestations arise suddenly, persist for 3 years, and cause growth reduction, top kill, and tree mortality. Most outbreaks occur in mature and senescing stands of western hemlock intermixed with Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, sitka spruce, *Picea sitchensis* (Bong.) Carr., Pacific silver fir, *Abies amabilis* (Dougl.) Forbes, and western red cedar, *Thuja plicata* Donn.

Potential outbreaks must be detected at an early stage and evaluated so that direct control can be applied promptly. Sampling of egg populations has been directed at mossy surfaces accessible from the ground or overstory trees, but never both. Studies to determine the distribution of *L. fiscellaria lugubrosa* eggs on both overstory trees and ground sites were conducted to improve sampling techniques for detection and evaluation surveys of infestations over large areas.

Sampling Procedure: An in-depth study of possible sampling locations for correlating egg density with defoliation levels is discussed. Due to the high costs of tree felling to obtain samples and the high error associated with all sampling locations, no procedure is recommended for estimating egg density. However, procedures for detecting looper infestations may be accomplished by visual examination of mossy log surfaces and bole sections at breast height, which were found superior to tree crown units. The strong association between moss and egg deposition indicated that egg densities for evaluation purposes should be expressed as the number of eggs per square meter of moss.