

Western Spruce Budworm

Choristoneura occidentalis Freeman

Lepidoptera: Tortricidae

Schmid, J. M.; Farrar, P. A. 1982. Distribution of western spruce budworm egg masses on white fir and Douglas-fir. Res. Pap. RM-241. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station; 7 p.

Objective: To improve sampling precision by determining the inter- and intra-crown distribution of *C. occidentalis* egg masses on white fir and Douglas-fir.

Abstract: Western spruce budworm, *C. occidentalis* Freeman, is a periodically severe defoliating pest of Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, and true firs (*Abies* spp.) in northwestern North America. Egg sampling is preferred over the other life stages of this pest due to ease of sample collection and assessment. Moreover, egg density of *C. occidentalis* can be sampled long in advance of damage, which helps when planning suppression projects for this pest.

Variation in egg mass densities was studied between and within trees to improve sampling precision. White fir was included in the study as the distribution of *C. occidentalis* on this host is not well known but is of importance when white fir occurs in mixed stands with Douglas-fir. Inter-tree variation in egg mass counts was high for both white fir and Douglas-fir. Consequently, the number of trees selected for sampling should be large enough to account for this variation. Earlier studies have suggested that 25 trees within the area of concern should be sufficient (McKnight et al. 1970). Egg mass density did not vary significantly between the lower and middle crown of Douglas-fir. Moreover, egg mass density did not vary significantly among cardinal directions sampled.

Sampling Procedure: Randomly select 25 trees within an area of concern. Randomly cut one 45-cm long (18 in.) branch from either the lower or midcrown of each tree and examine for egg masses. Avoid lower branches with little or no foliage. Trees should be widely spaced throughout the stand to account for variability within the stand. If the stand is homogeneous, it may be possible to reduce sampling effort somewhat by sampling 9 clusters of 3 trees each, spaced throughout the stand.

Note: This sample methodology should yield more precise estimates of budworm density for management decision-making, but no decision level was established for egg mass densities.

Reference:

* McKnight, M. E.; Chansler, J. F.; Cahill, D. B.; Flake, H. W., Jr. 1970. Sequential plan for western budworm egg mass surveys in the central and southern Rocky Mountains. Res. Note RM-174. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station; 8 p.