

Spruce Budworm

Choristoneura fumiferana (Clemens)

Lepidoptera: Tortricidae

Waters, W. E. 1974. Sequential sampling applied to forest insect surveys. In: *Proceedings of IUFRO/SAF/SUNY symposium on monitoring forest environment through successive sampling*. June 24-26; Syracuse, NY; 290-311.

Objective: To develop a sequential sampling plan for prediction of second and third instar *C. fumiferana* densities.

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 of *C. fumiferana* cause most of the defoliation. Periodic outbreaks occur every 30 years and epidemics can last 5-10 years. A study was carried out in northern Maine to develop a sequential sampling plan for second and third instars. These surveys can be used to supplement egg survey information, which is the standard means of predicting budworm population levels.

Five 38-cm branch tips collected in the mid-crown of each of five trees per survey point was the recommended sample size for this survey. The density of budworm per 38-cm twig needed to classify infestations as light, medium, and heavy was <5, 10-15 and >20, respectively. If after sampling 25 twigs a decision is not met, then select the classification level closest to the density estimate (Fig. 3).

Sampling Procedure: Select sample points over a representative portion of the area of concern. Cut five 38-cm twigs from each of five trees at each survey point. Search the staminate flowers, needles, and closed buds for budworm larvae. Once the cumulative number of budworm found reaches a decision boundary discontinue sampling. If 25 twigs are examined without a decision, sampling discontinues and the decision line nearest the count is chosen (Fig. 3).

Figure:

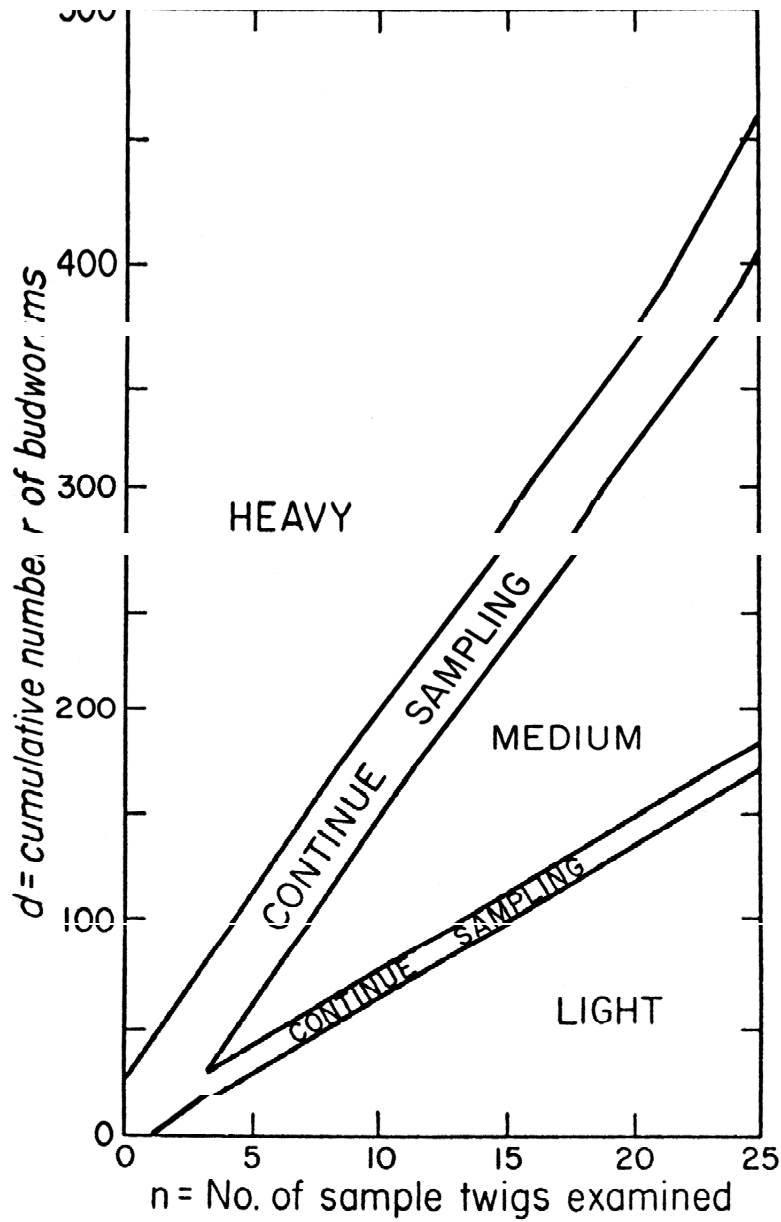


Figure 3. Sequential graph for sampling spruce budworm larvae (2nd-3rd instars) on balsam fir.

Figure 3 reprinted with permission from the IUFRO/SAF/SUNY symposium, January 15, 2001.