Jack Pine Budworm

Choristoneura pinus Freeman
Lepidoptera: Tortricidae

Batzer, H. O.; Jennings, D. T. 1980. Numerical analysis of a jack pine budworm outbreak in various densities of jack pine. *Environmental Entomology* 9: 514-524.

Objective: To determine if stand density influences the density of *C. pinus*.

Abstract: The jack pine budworm is an important pest of jack pine, *Pinus banksiana* Lamb., and to a lesser extent red pine, *P. resinosa* Ait., in the Great Lakes region and Canada. Extensive top kill is common during outbreaks, but tree mortality is rare unless infestations coincide with periods of drought.

A life table study of *C. pinus* was superimposed on a stocking level study of dense jack pine in northern Minnesota to determine if *C. pinus* density was related to stand density; and to provide a useful technique for sampling *C. pinus* egg masses. The number of eggs per hectare was estimated from branch samples by first expressing them as numbers per meter of foliated branch. Based on the data collected from 205 felled trees, an equation was developed to estimate total foliated length per tree ($Y = 5.54X_1 - 1.45X_2 - 1.11$). The number of eggs per egg mass (Y) was related positively to egg mass length (X) when an egg mass had two ($Y = 5.28X - 12.06$, $R^2 = 0.87$) or three ($Y = 6.50X - 11.76$, $R^2 = 0.87$) rows.

Sampling Procedure: Sample three trees from each 2.5 cm diameter class among those closest to the center of a 400-m^2 plot (6-18 trees). Clip one branch from the lower crown and another from the upper crown, and be careful not to dislodge egg masses. Estimate the number of eggs per ha by first expressing them as numbers per meter of foliated branch. Multiply this value by the estimated total foliated length per tree (Y) given by the equation:

$$Y = 5.54X_1 - 1.45X_2 - 1.11 \ (R^2 = 0.91)$$

where Y is in m, X_1 represents diameter at 1.3 m (d.b.h.; cm), and X_2 represents tree height (m).

Estimate the number of eggs per mass (Y) by the following regression equations based on egg mass length in mm (X) and number of egg rows:

$$Y = 5.28X - 12.06 \text{ (2 egg rows)}$$
$$Y = 6.50X - 11.76 \text{ (3 egg rows)}$$

Three row egg masses were those in which over half the length of the egg mass has more than two rows of eggs.