Pine Butterfly

Neophasia menapia (Felder & Felder)
Lepidoptera: Pieridae

Cole, W. E. 1956. Surveys and control methods of the pine butterfly during an outbreak in southern Idaho, 1953-1954. Res. Note RN-30. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 9 p.

Objective: To develop appraisal surveys for *N. menapia* for evaluation of spray treatment efficacy or predict infestations requiring control measures.

Abstract: Pine butterfly, *Neophasia menapia* (Felder & Felder), has been a serious pest of ponderosa pine, *Pinus ponderosa* P. & C. Lawson, and other *Pinus* spp. in the northwest USA. The caterpillars consume all age classes of pine needles, causing significant defoliation and mortality of infested trees. Aerial spray operations were initiated against this pest, but managers had no feasible sampling method to evaluate treatment efficacy. A sampling scheme is described for the eggs of *N. menapia*, the easiest life stage to sample this insect.

Sampling ridges was preferred over creek bottoms due to reduced variance in estimates from ridges. Greater than 10, 5–9, 2–4 and <2 eggs per 38 cm twig sample of new growth indicated epidemic, heavy, light, and endemic population of pine butterfly, respectively. Controls were warranted at densities of >5 eggs per twig.

Sampling Procedure: Sampling intensity and distribution of samples depend on the density and distribution of the butterfly population in the area of concern. Avoid sampling in creek bottoms as the distribution of pine butterfly is patchy and therefore requires significantly greater sampling effort to estimate populations within 25% of the mean.

To evaluate treatment efficacy, randomly select a survey line parallel to aerial spray lines. Select a tree every 100.6 m (5 chains) until the required number of trees have been sampled. If the spray block is too short to accommodate all trees on one line, start another line in the same spray block or area of concern. Randomly sample the required number of twigs from ground level to a height of ≈7 m above ground. The following recommendations, based on a 68% confidence interval with a 25% standard error of the mean, generally gave acceptable precision for management purposes:

1. Heavy infestations: sample two 38 cm twigs from each of 10 sequentially selected trees per area, or 10 twigs from each of three trees.

2. Moderate infestations: sample five 38 cm twigs from each of 20 trees per area.

3. Light infestations: sample five 38 cm twigs from each of 20 trees per area.

4. Endemic infestations: sample five 38 cm twigs from each of 25 trees per area.

To predict infestations requiring control measures, sample trees as described above. Population estimates are further refined as:

1. Epidemic infestation: ≥10 eggs per 38 cm twig
2. Heavy infestation: 5–9 eggs per 38 cm twig
3. Light infestation: 2–4 eggs per 38 cm twig
4. Endemic infestation: <2 eggs per 38 cm twig

Control measures are warranted if the average density of pine butterfly eggs on new growth is >5 per twig.

Note: This sampling scheme was developed in Idaho and should be used with caution until validated in other areas.