Pine Butterfly

Walter E. Cole [1]

The pine butterfly (*Neophasia menapia* (Felder & Felder)) occurs in ponderosa pine stands in the western United States and western British Columbia (fig. 1). Populations of this insect may remain relatively low for quite a few years and then the insect may appear in great numbers. During these outbreaks, the pine butterfly is a serious tree killer. Ponderosa pine is the preferred host tree, but during outbreaks, and particularly in stands of mixed species, this insect feeds on Douglas-fir, western white pine, larch, and western hemlock.

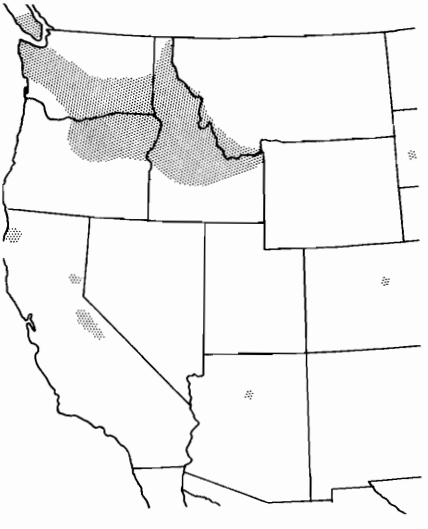

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Figure 1.—Distribution of the pine butterfly in Western United States and British Columbia.

There have been a number of severe outbreaks of the pine butterfly in the Northwest. In one outbreak, up to 90 percent of the ponderosa pines in a 150,000-acre area were killed, and nearly a billion board feet of timber was destroyed. In another outbreak, about 14 percent of the mortality of ponderosa pines was caused by bark beetles, which attacked the trees following defoliation by the pine butterfly.

Evidence of Infestation

The adult pine butterfly is readily observed within timber stands, and any increase in its population is quickly noted. Normally, a few adult butterflies can be observed in August. If, during aerial surveys of large forested areas, six or more butterflies are detected flitting about the top of each tree, epidemic populations can be expected the following year. Ground observations of about 24 butterflies per tree equal this aerial standard.

Under ordinary conditions, butterfly larvae feed only on the older needles, but under epidemic conditions they eat both new and old needles.

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U.S. DEPARTMENT OF AGRICULTURE
Forest Service
Revised September 1971

Description

The adult butterfly is white with black wing markings and has a wing spread of about 1¾ inches. In general, it resembles the common cabbage butterfly. Females have a distinct yellowish cast, but males are pure white (fig. 2).

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Figure 2.—Adult pine butterflies: Male, *upper*; female, *lower*. (Actual size.)

The emerald-green eggs are about 1 millimeter wide by 1¼ millimeters long and are laid in single rows on a needle (fig. 3).

Immature larvae are pale green and have black heads (fig. 4, *A*). Two white lateral stripes are present on the full-grown larva, and the head lightens to its final color of green (fig. 4, *B*). Mature larvae are approximately 1 inch long.

The female pupa is dark brown, and the male is yellowish green. Pupae of both sexes have yellowish-white lines similar to those on the mature larva.

Life History

The peak flight of the butterfly occurs about mid-August. Males usually emerge about a week before females. Mating often occurs immediately after females emerge. Within a few hours after mating, the female begins depositing eggs; these do not hatch until the following spring.

Larvae emerge from the eggs when new shoots of ponderosa pine are about 2 inches long. Both egg hatching and needle growth are directly affected by spring weather: warm temperatures cause early hatching. Feeding on needles occurs during the 6- to 8-week larval stage. Immature larvae feed gregariously on single needles at first, but later in their development they feed individually. During epidemics they may consume the entire needle; larvae of smaller populations destroy approximately one-half of the needle.

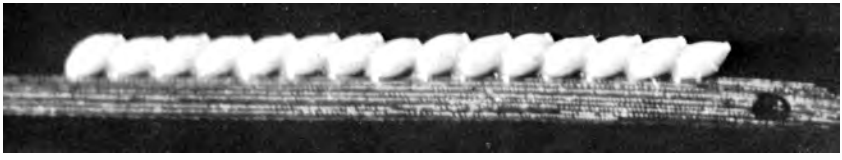

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Figure 3.—Eggs of pine butterfly (× 5).

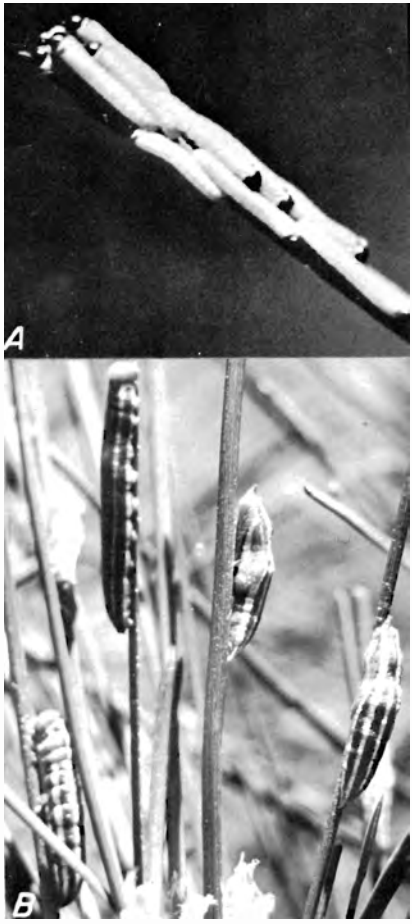

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Figure 4.—*A*, Gregarious feeding of first-instar larvae of pine butterfly (× 1.7); *B*, full-grown larvae and pupae of pine butterfly on needles of ponderosa pine (× 1.7).

Mature larvae migrate to bark crevices, limbs, or twigs, or they lower themselves on silken threads to the ground vegetation, where they transform to pupae. The pupal stage lasts for 10 to 15 days. There is but one generation each year.

Natural Control

Associated with the pine butterfly is a wasplike parasite (*Theronia atalantae* Poda) that has been credited with reduction of past outbreaks. Buildup of the parasite population usually lags 1 to 2 years behind buildup of the butterfly population. Large numbers of the fly, *Agria affinis* Fall., that parasitizes pupae, and the sucking bug, *Podisus placidus* Uhler, have been found preying on the pine butterfly; limited numbers of a snake fly were also found. How effective these natural enemies are in controlling or preventing outbreaks of the butterfly is unknown.

References

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