

Yellowheaded Spruce Sawfly

Pikonema alaskensis (Rohwer)

Hymenoptera: Tenthredinidae

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Objective: To predict *P. alaskensis* defoliation trends with a model developed by Morse and Kulman (1985) in order to determine if control measures were needed.

Abstract: The yellowheaded spruce sawfly, *Pikonema alaskensis* (Rohwer), is a serious pest of young (5 to 9 yr old), open grown spruce, *Picea* spp., stands in the northern US and Canada. This insect feeds exclusively on new foliage in the upper crown of host trees, and high defoliation in two or more consecutive years can adversely affect tree growth. Trees severely defoliated by *P. alaskensis* will have a bare upper crown and a conspicuous ring of green foliage in the lower crown.

A model developed by Morse and Kulman (1985) was used to predict defoliation trends (I), which were based on pheromone trap catches of *P. alaskensis* and *Syndipnus rubiginosus*, a major parasite of *P. alaskensis*, as well as their interaction term and tree height.

If $I > 1$ and defoliation had been observed in previous years, then direct control was recommended. If $I < 1$, then populations were likely to decline as a result of natural enemies. Pheromone trapping techniques were also recommended as a useful tool for detecting *P. alaskensis* populations in high hazard areas.

Sampling Procedure: In one Pherocon II (Trece Inc., Salinas, CA) sticky trap place a dispenser (1cm² or 16 ml polymeric film) filled with 0.67 mg of sawfly pheromone ([Z]-10-nonadecenal, Hercon Division of Health Chem. Corp (New York)). In the other trap place a dispenser of similar size but filled with 0.62 mg of parasitoid pheromone (ethyl [Z]-9-hexadecenoate, Sigma Chemical Corp. (St. Louis, MO)). During the period of adult sawfly activity, hang a trap with sawfly pheromone 1.5 m high in the crown of one tree in the center of each plot within the area of concern. During the period of adult parasitoid activity, which in Morse and Kulman (1985) was approximately a month after the period of adult sawfly activity, hang a trap with parasitoid pheromone in the same tree and height above ground as used for the sawfly trap. It may suffice to use one set of traps for every five acres of plantation sampled. Count the numbers of sawfly and parasitoid caught in each trap. Use the formula: $\log(I) = 1.36 - 0.17\log(S) - 0.25\log(P) + 0.13\log(S*P) - 0.3\log(Ht)$ to determine the defoliation trend (I), where (S) = trap catch of sawflies, (P) = trap catch of parasite, ($S*P$) = the interaction term of (S) and (P), and (Ht) = tree height. If $I > 1$ and defoliation had been observed in previous years, then direct control was recommended. If $I < 1$, then populations were likely to decline as a result of natural enemies. See Morse and

Kulman (1985) for more details on the period to deploy traps, trap placement, and development of the formula to predict defoliation trend (*I*).

Morse and Kulman (1986) describe a hazard rating system for *P. alaskensis* that might be useful in the establishment of spruce plantations.

References

Morse, B.W. and H.M. Kulman. 1985. Monitoring damage by yellowheaded spruce sawflies with sawfly and parasitoid pheromones. *Environmental Entomology* 14: 131-133.

Morse, B.W. and H.M. Kulman. 1986. A method of hazard-rating white spruce plantations for yellowheaded spruce sawfly defoliation. *Northern Journal of Applied Forestry* 3: 104-105.