Black Larch Aphid

Cinaria laricifex (Fitch)
Homoptera: Aphididae

Webster, R. 1983. Sample collection method and sequential sampling plan for mites *(Oligonychus ununqui*s) and aphids *(Cinaria laricife*x) on tamarack. *Canadian Forest Service Technical Note* No. 278: 5 pages.

Objective: To develop a fixed precision sequential sampling plan to be used in determining the optimal number of samples to collect to monitor black larch aphid population levels.

Abstract: The black larch aphid, *Cinaria laricifex* (Fitch), is a common pest of young conifers such as larch, *Larix* spp., and spruce, *Picea* spp.. Infested needles become yellow-spotted and can eventually fall off the tree. High population densities may cause a loss of tree vigor.

A sequential sampling plan was developed for *C. laricifex* on larch. Depending on the level of precision desired from 12 to 50 trees need to be sampled. Known threshold levels can be applied to this sampling plan to determine how many branch samples are needed to indicate the necessity of control treatments.

Sampling Procedure: Select at least 25 sample trees randomly in each stand of trees being surveyed. Sample one branch per tree, beating each branch with a 60 cm long padded stick ten times in rapid succession to dislodge any aphids into a 30 x 20 x 8 cm container held under the branch. Wash the sample out of the collection container with 35-40 ml of Oudeman's solution (8.7 L of 70% alcohol, 0.5 L glycerine, 0.8 L glacial acetic acid to make 10 L of solution) and into a 50 ml screw cap vial. The Oudeman's solution kills and preserves all aphids in the sample, allowing for identification at a later date.

Remove needles, large pieces of debris, and excess Oudeman's solution, from the sample. Poor the remainder into a 8.5 cm diameter petri dish that has the bottom covered by a 1 cm grid. It takes ~2-4 minutes to prepare each sample.

Count the cumulative number of aphids in each sample until the stop line is crossed for the desired level of sampling precision (Fig. B). For higher levels of precision, >25 samples should be taken.

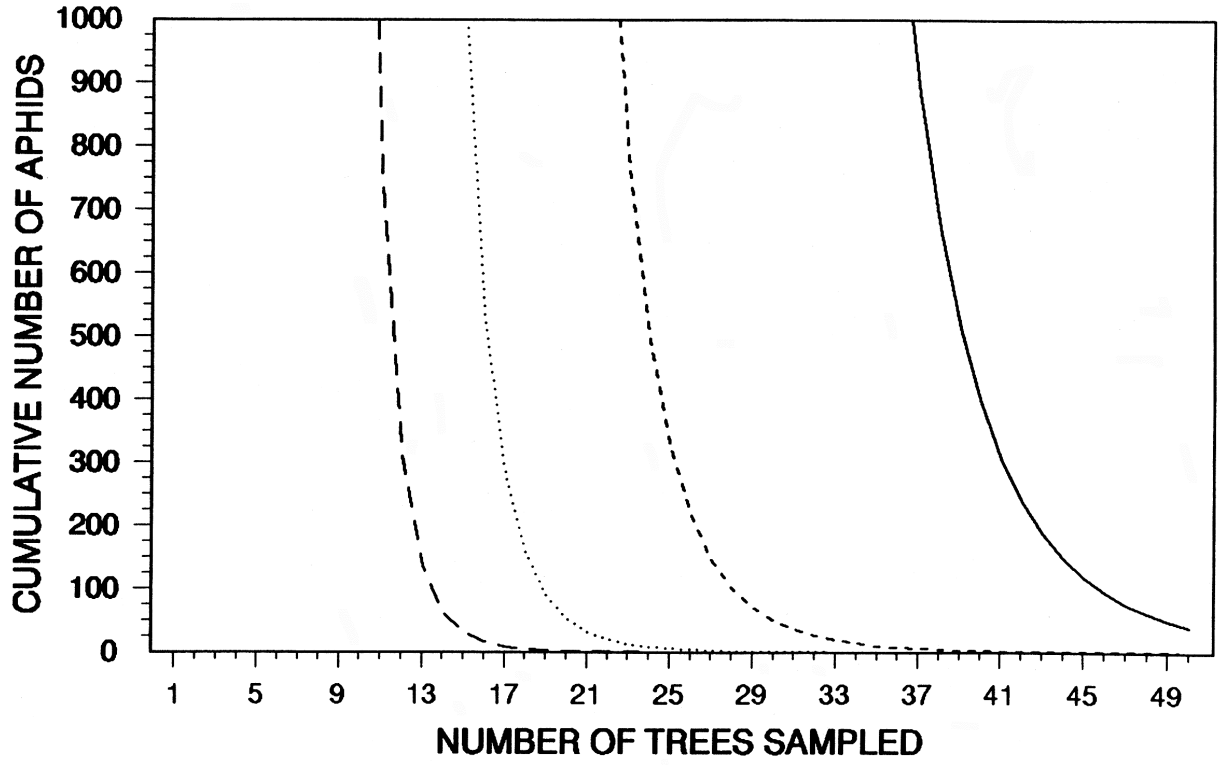

Fig. B. Sequential sampling plan for black larch aphid (*Cinaria laricifex*) on larch based on Taylor's power law. Sequential sample stop lines are given for precision levels (lines right to left) of D = 0.20, 0.25, 0.30 and 0.35.