Spruce Spider Mite
Oligonychus ununquis (Jacobi)
Acari: Tetranychidae

Objective: To develop a fixed precision sequential sampling plan to be used in determining the optimal number of samples to collect to monitor spider mite infestation levels.

Abstract: The spruce spider mite, *Oligonychus ununquis* (Jacobi), is a common pest of young conifers. Infested needles become yellow-spotted and webbed together, and can eventually fall off the tree. High population densities may cause a loss of tree vigor.

A sequential sampling plan was developed for the spruce spider mite on larch, *Larix* spp.. Depending on the level of precision desired from 4 to 49 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 spider mites 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 all mites in the sample and allows for appendage extension, which facilitates identification.

Remove needles, large pieces of debris, and excess Oudeman's solution from the sample. Pour the remainder into a 8.5 cm diameter petri dish that has the bottom covered by a 1 cm grid. It takes ~12-19 minutes to prepare and count each sample. If 1000 mites have been counted in a sample, discard the remainder and proceed to the next sample.

Count the cumulative number of spider mites in each sample until the stop line is crossed for the desired level of sampling precision (Fig. A). For higher levels of precision, >25 samples may need to be taken.
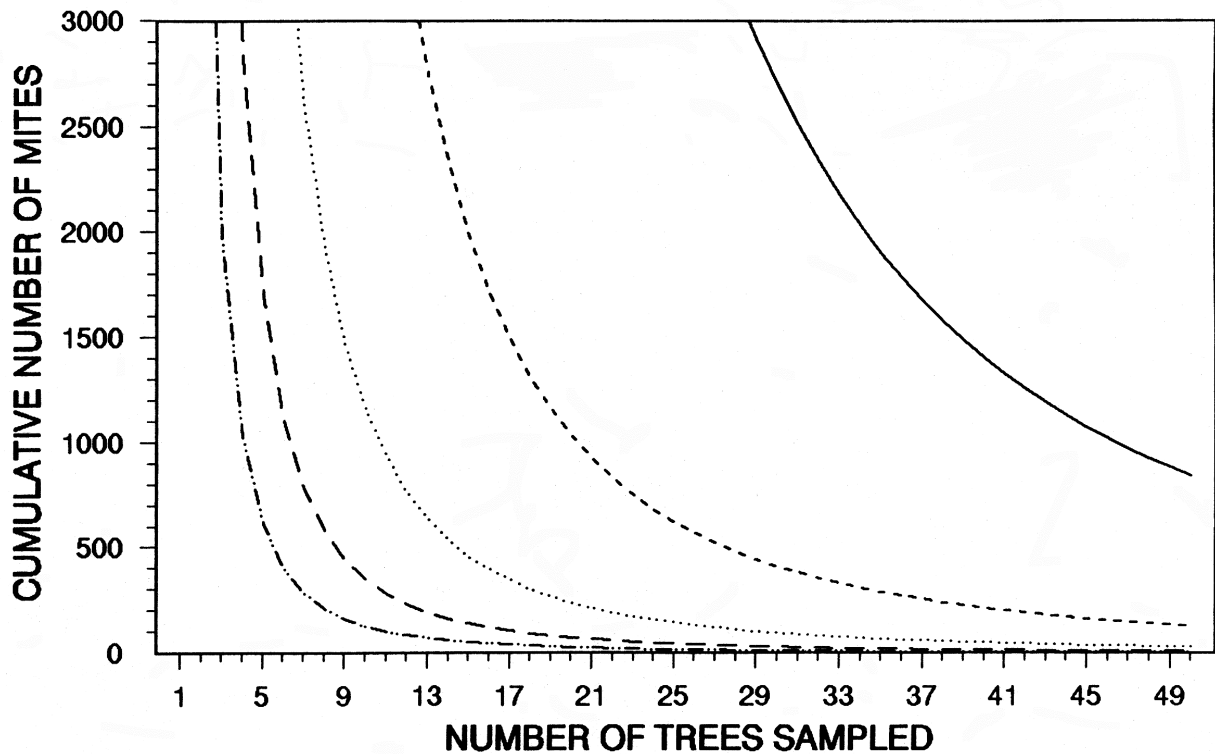
Fig. A. Sequential sampling plan for mites on larch based on Taylor's power law. Sequential sample stop lines are given for precision levels (lines right to left) of D = 0.15, 0.20, 0.25, 0.30 and 0.35.