Sycamore Lace Bug

Corythucha ciliata (Say)
Hemiptera: Tingidae

Horn, K. F.; Farrier, M. H.; Wright, C. G.; Nelson, L. A. 1983. A sampling method for estimating egg and first-instar densities of the sycamore lace bug, *Corythucha ciliata* (Say). Journal of the Georgia Entomological Society 18: 37-49.

Objective: To develop fixed precision estimation plans for eggs and first-instar nymphs of *C. ciliata* on individual trees using Taylor's power law.

Abstract: The sycamore lace bug is a minor pest of sycamore, *Platanus occidentalis* L. In 1983, the importance of *C. ciliata* in Europe, where it is an exotic pest, was increasing. A sequential estimation plan was devised for eggs and first-instar nymphs to aid in basic research on this insect.

Both plans were based on Taylor's power law. Log variance was related positively to *C. ciliata* eggs (log variance = log 19.11 + 1.393log mean; r^2 = 0.94) and first-instar nymphs (log variance = log 7.831 + 1.594log mean; r^2 = 0.92). This information was used to develop sequential estimation plans for eggs and first-instar nymphs at the 0.20 and 0.25 levels of fixed precision. Control measures were recommended if densities of *C. ciliata* exceeded 2 eggs/cm^2.

Sampling Procedure: Select sycamore trees at random. Sample an equal number of similar-sized leaves from each cardinal direction from the lower (≤3.5 m) part of the canopy. The third to fifth leaves from the terminal leaf were used in this study. On the underside of each leaf, count the number of eggs or first instars per leaf. Average the densities among all leaves sampled from one tree. If the leaf appears to have more than 100 eggs on it, count the number of eggs on one half of the leaf divided by the midvein and then double the tally for the estimate of that leaf. Stop sampling leaves when the mean number of eggs or first instars per leaf crosses the desired level of fixed precision at either of the t-values (probability that the mean is within the level of fixed precision) (see Figs. 2 & 3 for eggs or nymphs, respectively). Trees are classified as lightly or heavily infested if the density of eggs is <1.0 or >2.0 eggs per cm^2 of leaf area, respectively. However, leaf area must also be sampled to use this threshold. Allow at least 2 weeks to pass after sampling eggs before sampling first instars to allow all eggs to hatch.

Notes: The authors did not specify infestation levels for first instars; use the infestation levels given for eggs with caution. This sampling plan was developed from samples on relatively few trees in one location. Thus, variation in mean and variance among different populations of *C. ciliata* was not addressed in this study. Please use this plan with caution if sampling lace bugs in locations other than Raleigh, NC.

Figures

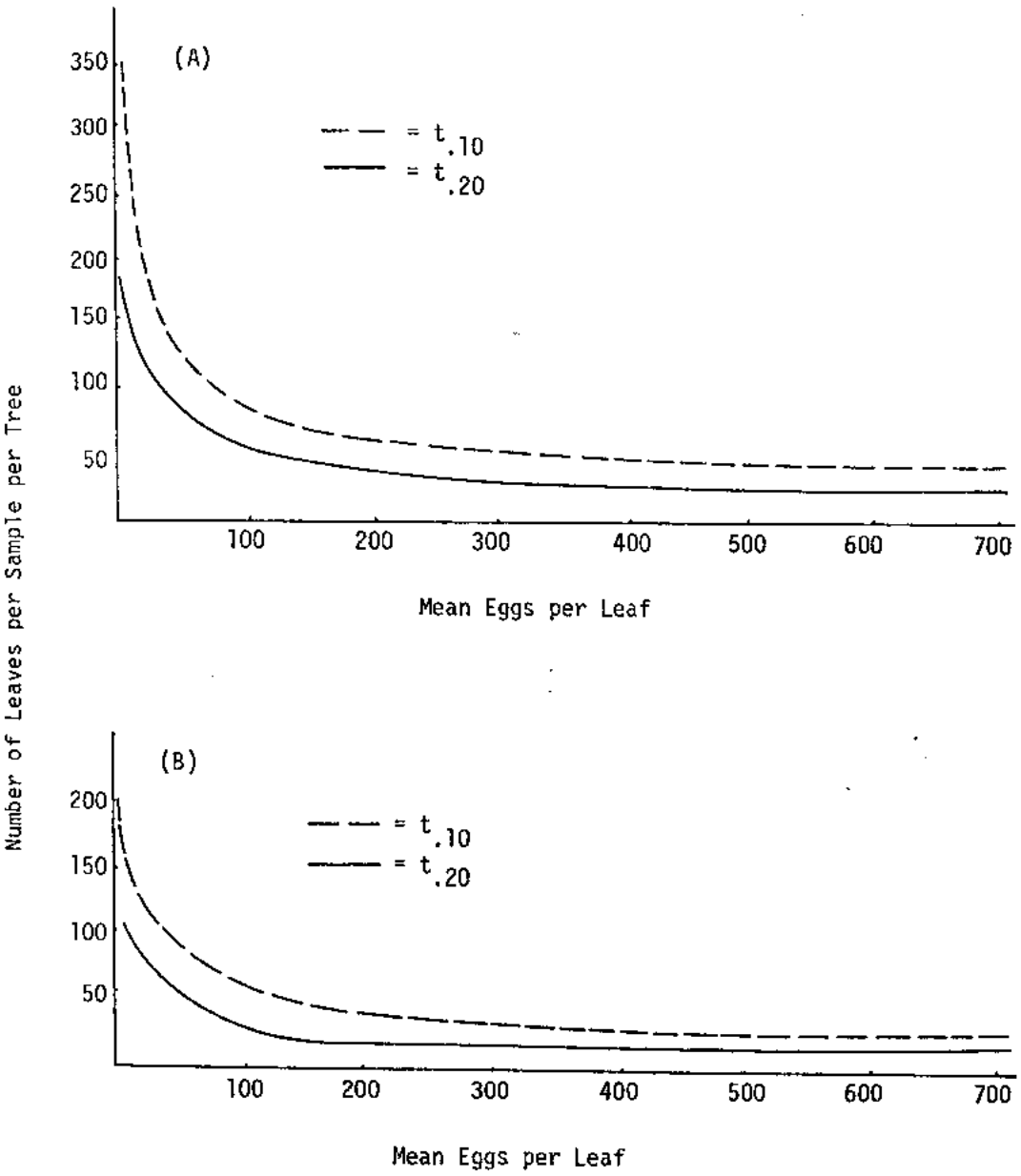

Fig. 2. Number of leaves needed to estimate the mean *Corythucha ciliata* egg density within a tree with a given level of accuracy and reliability (A) D = .20 and (B) D = .25. Dashed and solid lines represent the critical t-statistics at the 0.1 and 0.2 probability levels (two-tailed), respectively.

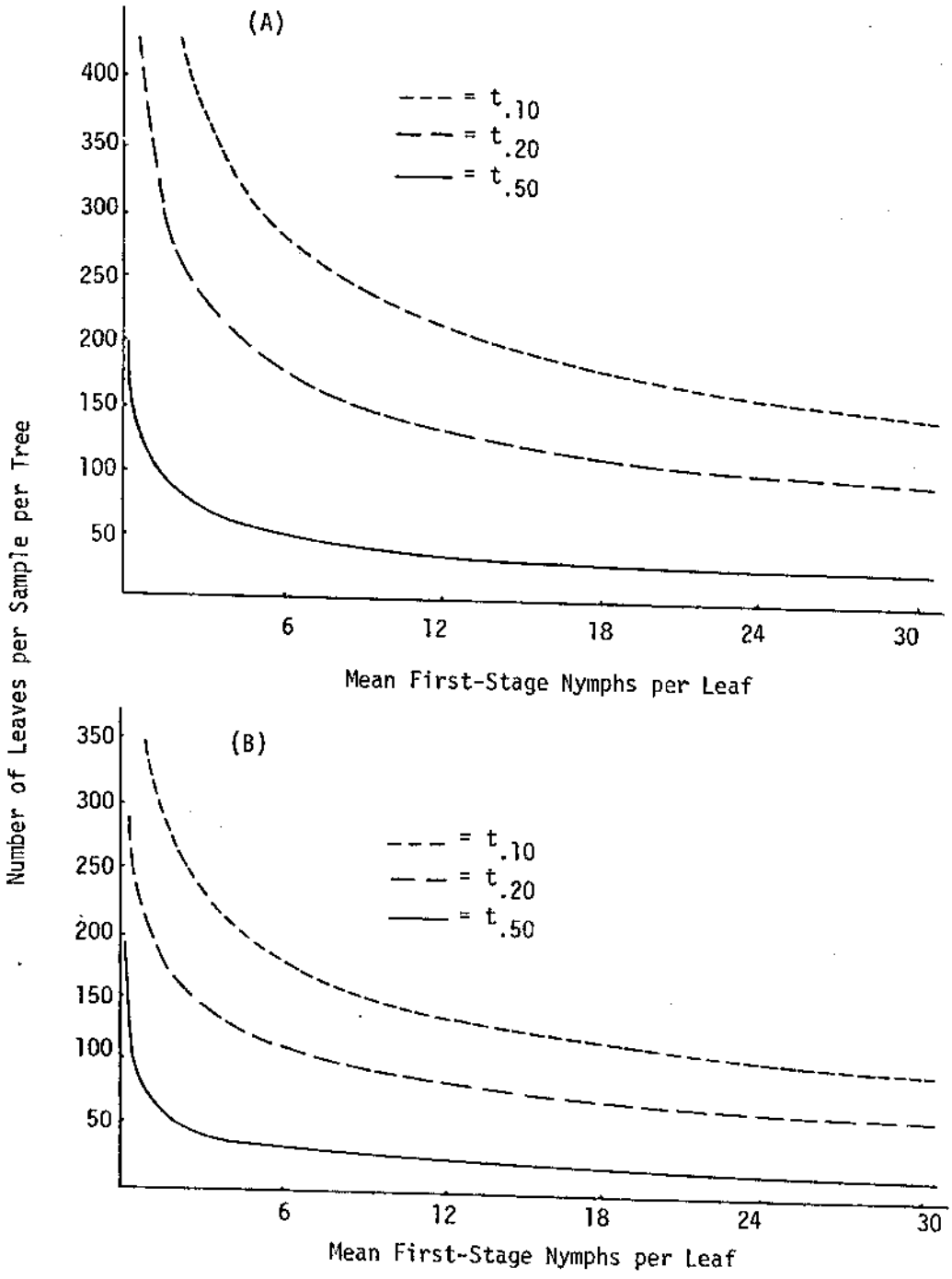

Fig. 3. Number of leaves needed to estimate the mean *Corythucha ciliata* first-instar density within a tree with a given level of accuracy and reliability (A) D = .20 and (B) D = .25. Dotted, dashed, and solid lines represent the critical t-statistics at the 0.1, 0.2, and 0.5 probability levels (two-tailed), respectively.