

## Bagworm

*Thyridopteryx ephemeraeformis* (Haworth)

Lepidoptera: Psychidae

Raupp, M. J.; Davidson, J. A.; Koehler, C. S.; Sadof, C. S.; Reichelderfer, K. 1988. Decision-making considerations for aesthetic damage caused by pests. *Bulletin of the Entomological Society of America* 34: 27-32.

**Objective:** To provide a sampling plan for *T. ephemeraeformis* with reference to quantified economic and aesthetic injury levels for making management decisions.

**Abstract:** Bagworm, *Thyridopteryx ephemeraeformis* (Haworth), is a defoliator of many trees and shrubs, including arborvitae, *Thuja occidentalis* L.. Bagworm larvae are covered by a characteristic loose silk bag covered with bits of organic material, which they construct for concealment. Larvae hang on the branches and feed on the foliage of the host tree, and high densities of bagworms give the tree the appearance of being covered with unsightly brown cones.

An economic injury level (EIL) was developed for retail nurserymen based on the estimated cost of management, the market value, and the injury produced by *T. ephemeraeformis* for a 1.2-m arborvitae. The EIL was estimated to be 4 first instar *T. ephemeraeformis* per 1.2-m tree. The low value of the EIL reflects the low tolerance of homeowners and their perceptions of greatly reduced value associated with the presence of the insect on an ornamental plant.

An aesthetic injury level (AIL) was developed for bagworm based on when half the customers at a nursery retail center would initiate control measures for the pest. The relationship between when customers believed the arborvitae had been damaged by *T. ephemeraeformis* and when control measures were required was quantified. Regression analysis indicated that half of the polled customers perceived the foliage injury produced by approximately 9 first instars per 1.2-m of tree height sufficient to warrant control measures. This aesthetic threshold corresponds to approximately 7% of the crown being discolored or defoliated. Half of the polled customers would consider the foliage injury produced by approximately 6 first instars per 1.2-m tree as damaging to the plant. This AIL represents <8% of the crown being discolored or defoliated.

**Sampling Procedure:** Examine arborvitae for the presence of *T. ephemeraeformis* in its characteristic bags. If the density of *T. ephemeraeformis* on an individual tree is  $\geq 6$  first instars per 1.2 m of tree stem, nursery managers should initiate control measures to maintain a desirably high aesthetic quality of ornamental arborvitae.

**Notes:** The AIL of 6 or more first instar *T. ephemeraeformis* per 1.2 m of arborvitae stem, based on customer perception of aesthetic damage, is marginally higher than the EIL of 4 first instars per 1.2 m of tree stem, which was based on economic parameters. The actual injury by *T. ephemeraeformis* observed on arborvitae during this study was largely cosmetic as the plants tolerated high levels of defoliation without associated mortality and injury was not evident several years later after refoliation.