

Nantucket Pine Tip Moth

Rhyacionia frustrana (Comstock)

Lepidoptera: Tortricidae

Asaro, C.; Berisford, C. W. 2001. Predicting infestation levels of the Nantucket pine tip moth (Lepidoptera: Tortricidae) using pheromone traps. *Environmental Entomology* 30: 776-784.

Objective: To correlate trap catches of *R. frustrana* with population density and host damage in the Georgia Piedmont.

Abstract: Nantucket pine tip moth, *Rhyacionia frustrana* (Comstock), is a common pest of young loblolly, *Pinus taeda* L., shortleaf, *P. echinata* Mill., and Virginia, *P. virginiana* Mill., pine plantations in the eastern USA. Larval feeding can cause shoot mortality and tree deformity, reductions in height and volume growth, increases in compression wood formation, and occasional tree mortality. Research was conducted in the Georgia Piedmont over one to several years to correlate trap catch with population density and tree damage.

Hyperbolic curves best described the relationships between total trap catch and moth population density, and between trap catch and shoot damage, for one generation and the next. These relationships suggest that trap saturation may occur at very high densities of adult moths. However, relationships between trap catch of one generation to the density of subsequent generations and their damage had predictive values. Total trap catch of the first adult generation of *R. frustrana* was related positively to shoot damage produced by first generation brood ($y = 0.024x - 2.022$; $r^2 = 0.87$). Trap catch of the first generation was related positively to the density of the overwintering brood generation ($y = 2815.277x / (2.014 + x)$; $r^2 = 0.89$). Likewise, trap catch of the first generation was related positively to shoot damage caused by the overwintering brood generation ($y = 4660.129x / (61.730 + x)$; $r^2 = 0.82$). However, trap catch of the second generation gave only fair predictions of later population densities or host damage.

Sampling Procedure: Use Pherocon 1C wing traps (Trécé, Salinas, CA) with rubber septa loaded with *R. frustrana* pheromone. Select a 2-ha rectangular plot within a plantation. Set traps with one in each corner of the plot and one halfway along both of the two longest sides for a total of 6 traps per plot. Traps should be at least 30 m inside the edge of the plantation and apart from each other. Replace baits weekly for maximum efficacy. Record the number of trapped males and empty traps or replace the bottoms every 3-5 days. Assume that a certain percentage of the total moths for a given emergence period will be trapped before the spray date. Spray dates for much of the southeastern USA can be predicted using degree-day accumulations (Fettig et al. 2000).

Note: The authors recommend use of this procedure with caution, as trap efficacy might be region-specific and validation may be required before widespread use is considered. While no damage threshold has been established for *R. frustrana*, the authors suggest that control is warranted when the cumulative trap catch within a plot exceeds 1,000 moths before the spray date, given that <40% infested shoots appears to limit host growth.

Reference:

Fettig, C. J.; Dalusky, M. J.; Berisford, C. W. 2000. Nantucket pine tip moth phenology and timing of insecticide spray applications in seven southeastern states. Res. Pap. SRS-18. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station; 23 p.