Pales Weevil
Hylobius pales (Herbst)
Coleoptera: Curculionidae

Rieske, L. K; Raffa, K. F. 1993. Potential use of baited pitfall traps in monitoring pine root weevil, *Hylobius pales*, *Pachylobius picivorus*, and *Hylobius radicis* (Coleoptera: Curculionidae) populations and infestation levels. *Journal of Economic Entomology* 86: 475-485.

Objective: To determine the predictive potential of this monitoring system for use in an Integrated Pest Management (IPM) program for *H. pales.*

Abstract: Plantation pine, *Pinus* spp., production in the Lake States is often limited by the feeding of adult pales weevil, *Hylobius pales* (Herbst), which can cause extensive seedling mortality and disfigurement of young trees. Population fluctuations of *H. pales* were monitored in five Wisconsin Christmas tree plantations of 5-year-old Scots pine, *Pinus sylvestris* (L.). Trees were spaced 1.8 m apart, and had not received insecticide treatment. Pitfall traps were baited with 2 ml of turpentine (46% -pinene, 42% -pinene, 2% -phellandrene, 1% limonene, 0.9% camphene and 0.8% myrcene) and 2 ml of 95% ethanol in separate vials and tested at 6, 18 and 32 traps per 432 m^2 to determine their ability to detect weevil activity.

The lowest trap density (6 traps) had the best correlation between trap catch and damage indices, and was the least expensive sample to obtain. The 1988 trap catch of female *H. pales* was correlated positively with infestation level and infestation severity in 1988, 1989 and 1990. This trapping method could be used to forecast *H. pales* density and predict damage, but more work is needed to confirm these relationships.

Sampling Procedure:

Pitfall traps: Use 17 cm long by 10 cm wide sections of plastic PVC pipe (see Tilles and others 1986). Drill eight 7-mm entrance holes around the perimeter of each trap, 6 cm from the top end. Coat the inside of each trap with liquid Teflon (DuPont de Nemours, Wilmington, DE, USA) which will prevent weevil escape. Drill an additional two 2-mm holes in the trap wall and attach a 14-gauge wire. Place a 2 ml vial of 95% ethanol and a 2 ml vial of turpentine (Mantz Paint, Madison, WI, USA) in each trap by suspending each from the 14 gauge wire. The vials will then be approximately 4 cm below ground level. Cap both ends of the trap, and drill two 2-mm holes in the bottom cap to allow water drainage. Coat the aboveground cap and the exposed portion of the PVC pipe with flat black paint in order to resemble a tree trunk. Bury each trap until the entrance holes are flush with the soil surface level.

Space traps evenly within a 432 m^2 block (i.e., 8-9 m). Monitor all traps weekly throughout the activity period of *H. pales*. Remove all weevils and replenish the baits during each sample collection.

To estimate infestation levels and the condition of tree foliage, take a subsample of trees within the 432 m^2 and look for the following:

Infestation levels: Examine the root collar of 12 trees per block for larval tunneling to a depth of 12 cm into the soil. Calculate two indices of infestation based on this data:

1. infestation level = # trees infested/# trees in subsample
2. infestation severity = (the sum of the proportion of damaged stem perimeters/# subsampled trees) x 100.

Incidence of foliar symptoms: Grade all trees in block on the basis of needle color. Trees with green (visibly healthy), yellow (intermediate degradation), and red or brown (dead) needles are given a 1, 2 and 3, respectively. Use this data to determine four indices of foliar symptoms:

1. symptom level = proportion of symptomatic trees
2. foliar severity = sum of foliar grades/# trees in replicate
3. proportion of yellow trees
4. proportion of red trees

These indices will help predict population density as well as provide an indication of damage levels.

Note: Better damage estimates may be obtained if pitcheating weevil, *Pachylobius picivorus* (Germar), pine root collar weevil, *Hylobius radicis* Buchanan, and *H. pales* are treated as a complex rather than trying to estimate damage separately for each individual species.

Reference:

Tilles, D. A.; Sjödin, K.; Nordlander, G.; Eidmann, H. H. 1986. Synergism between ethanol and conifer host volatiles as attractants for the pine weevil, *Hylobius abietis* (Linnaeus) (Coleoptera: Curculionidae). *Journal of Economic Entomology* 79: 970-973.