

Pitcheating Weevil

Pachylobius picivorus (Germar)

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 radialis* (Coleoptera: Curculionidae) populations and infestation levels. *Journal of Economic Entomology* 86: 475-485.

Objective: To investigate the predictive potential of this monitoring system for use in an integrated pest management (IPM) system for *P. picivorus*.

Abstract: Plantation pine, *Pinus* spp., production in the Lake States is often limited by the feeding of adult pitcheating weevils, *Pachylobius picivorus* (Germar), which can cause extensive seedling mortality and disfigurement of young trees. Population fluctuations of *P. picivorus* were monitored from 1988 to 1990 in five, 5-year-old Scots pine, *Pinus sylvestris* (L.), plantations in central Wisconsin. Trees were spaced 1.8 m apart and had not received insecticide treatment. Pitfall traps were baited with 2 ml of turpentine (46% α -pinene, 42% β -pinene, 2% α -phellandrene, 1% limonene, 0.9% camphene and 0.8% myrcene) and 2 ml of 95% ethanol and tested at 6, 18 and 32 traps per 432 m² 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. Trap catch of *P. picivorus* was correlated significantly with 1988 to 1990 foliar symptoms, suggesting that either assessing population levels of *P. picivorus* or their damage may be useful at forecasting future population trends and damage levels.

Sampling Procedure:

Pitfall traps: Use 17 cm long by 10 cm wide plastic PVC pipes (see Tilles and others 1986). Drill eight 7-mm wide 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) to prevent weevil escape. Drill two 2-mm holes in the trap wall just below the entrance holes. Attach a 14 gauge wire through these two holes. Place a 2-ml vial of 95% ethanol and a 2-ml vial of turpentine (Mantz Paint, Madison, WI) in each trap by suspending both vials from the wire approximately 4 cm below ground level. Cover each end of all traps with plastic caps. Drill two 2-mm holes in the bottom cap to drain water. Paint the above ground cap, and the exposed portion of the PVC pipe, black in order to resemble a tree trunk. Bury traps vertically until entrance holes are flush with ground level.

Space traps evenly within the 432 m² block (i.e., 8-9 m). Monitor all traps weekly throughout the activity period of *P. picivorus*. Remove all weevils and replenish all baits during each sampling interval.

To determine infestation levels and tree damage in each 432 m² block, subsample an appropriate number of trees 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 the following 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 should be 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.

Note: Better damage estimates may be obtained if *P. picivorus*, pales weevil, *Hylobius pales* (Herbst.), and pine root collar weevil, *Hylobius radialis* Buchanan, are treated as a complex rather than trying to estimate damage separately for each of these closely related 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.