

Spruce Cone Maggot

Strobilomyia neanthracina Michelsen

Diptera: Anthomyiidae

Sweeney, J. D.; Miller, G. E.; Ruth, D. S. 1990. Sampling seed and cone insects in spruce. In: West, R. J., editor. Proceedings of the cone and seed pest workshop. 1989 October; St. John's, Newfoundland. Inf. Rep. N-X-274. *Canadian Forest Service*; 63-75.

Objectives: To determine if the percentage of damaged seeds per cone is positively related to *S. neanthracina* density per conelet; to determine what sample size is necessary to estimate *S. neanthracina* egg density; and to determine what infestation levels are required to justify control.

Abstract: The spruce cone maggot, *Strobilomyia neanthracina* Michelsen, is a destructive, seed-eating cone fly of spruce, *Picea* spp., in Canada. One egg is laid per cone and after hatching the larva feeds on the developing seeds while moving spirally around the cone axis. A study was conducted in the interior of British Columbia, Canada, to determine if seed damage to white, *Picea glauca* (Moench) Voss., and Engelmann, *P. engelmannii* L., spruce was positively related to *S. neanthracina* infestation level and density per conelet. These data were used to develop recommendations for sampling *S. neanthracina* to determine if control measures were warranted. The percentage of seeds damaged per cone was positively related to both the percentage of cones infested and density of *S. neanthracina* per cone. The number of sample trees required to estimate egg density with 90% confidence and 10% error was from 218 to 542. This sampling intensity was considered too large to be practical for field applications. The optimal number of conelets to sample per tree was two. Control measures were warranted if *S. neanthracina* egg densities exceeded 0.3 per conelet.

Sampling Procedure: Systematically select from 218 to 542 trees to be sampled in the area of concern. At each tree, collect two conelets from the upper to mid-crown when conelets are about half pendant. Conelets can be bulked and stored at -10 °C until dissected. The number of person-days required to sample this many conelets ranged from 5 to 12.

Dissect conelets with a pair of fine forceps under a stereoscopic microscope at 10 power magnification. Starting from the base of each cone and working towards the tip, pull each cone scale away from the conelet, looking for presence of eggs, larvae, and feeding damage. Eggs are white and oblongate (about 1.4 by 0.5 mm) and are laid between the cone scales. Immature larvae are more difficult to see if they have just hatched from the egg. Look for hatched, flattened eggs with signs of feeding nearby and the small white translucent larva with its pair of black mouth hooks.