

Description of the field experiments on the spruce seed moth, *Cydia strobilella*, the spruce coneworm, *Dioryctria abietella*, and the cloaked pug, *Eupithecia abietaria*, in Swedish seed orchards of Norway spruce, *Picea abies*, 2011-2015.

The three moth species studied, the spruce seed moth, *Cydia strobilella*, the spruce coneworm, *Dioryctria abietella*, and the cloaked pug, *Eupithecia abietaria*, are frequent pests in seed orchards of Norway spruce, *Picea abies*, in Europe. The purpose of the study was to monitor the presence, abundance, and flight phenology of these moths in five spruce seed orchards and one spruce clone archive in southern Sweden using pheromone-baited traps and relate trapping data to damage on cones caused by larvae of these pests. Both *C. strobilella* and *D. abietella* were monitored at all six sites during six subsequent years (2010-2015), whereas *E. abietaria* was monitored at three of the sites and only in 2014. Specific information about the field sites (area, management, geographic coordinates etc) can be found in the file "Info about experimental sites".

In the central part of each field site, six monitoring traps of each species were placed in a circle with a radius of 20 m, and with half of the traps placed at 2 m height and the other half placed at 4-5 m height in the spruce trees. Transparent plastic delta traps with sticky inserts, purchased from CSalomon (Plant Protection Institute, Hungarian Academy of Science, Budapest, Hungary), were used. Sex pheromone blends were prepared in the laboratory at the Department of Biology, Lund University, Lund, Sweden, and applied on red rubber septa (11 × 5 mm, #224100–020) from Wheaton Science Products (Millville, NJ, USA) to be used as lures. Information about the composition of the species-specific sex pheromones used in trap baits is found in the file "Pheromone lures for trapping".

Trapping of *C. strobilella* started in mid or late April and ended in mid or late June, trapping of *D. abietella* started in mid or late May and ended in late September or early October, and trapping of *E. abietaria* started in late May and ended in mid October. Traps were normally checked once per week during the field season (less frequently late in the season for *D. abietella* and *E. abietaria*), and sticky inserts replaced if needed. Baits were replaced once per season for *C. strobilella*, twice per season for *E. abietaria*, whereas baits for *D. abietella* were used throughout the field season.

Catch data for each moth species and site are found in files with the format: "method_species name_site_time period". In these files, the total number of male moths found in the six traps each week of the experiment is shown. Weeks when traps were not checked are coded NA, and weeks when traps were not present are coded -. In 2011, two seed orchards (Gälltofta and Maglehem) were treated with high doses of synthetic pheromone for mating disruption of *C. strobilella* and *D. abietella*, and this is indicated in the catch files.

In addition to the trapping experiments, cone surveys were performed at the study sites by the end of July or early August each year except in 2012-2013 when flowering was very poor at all sites. All cones were counted on a central tree in the middle of the circle of pheromone traps, and on five trees in each perpendicular direction, resulting in 21 trees analyzed. The total number of cones observed divided by 21 was used to determine the mean number per tree for each year and site.

To estimate the damage caused by larvae of the three pest species, cones were sampled at the same occasions as the surveys. Ten cones per tree were randomly sampled from ten of the 21 trees included in the survey, collecting both cones high up and low in the trees. Thus, in total 100 cones were sampled from each location during all flowering years. At some sites, cone production was very poor also during the years of cone surveys, and damage analyses could not be performed. On some occasions, no cones were produced on the 21 survey trees but on other trees at the site, and cones for larval analysis were sampled from these instead. The cones were dissected in the lab and the number of larvae of each moth species was counted to determine the average number of larvae per cone for each species, and by multiplying by the mean number of cones per tree also the number of larvae per tree. Cone survey data and damage data for each site are found in files with the format: "cone_survey_damage_site_time period".