

Reproductive biology of *Dioryctria abietivorella*

2008 Executive Summary

Two main research projects were completed in the 2008 field season. Both related to the reproductive behaviour of *D. abietivorella*, with the objective of understanding behaviours that will lead to improved management of the pest.

1. Seasonal flight activity and mating status

It is important to know when moths are reproductively active, during the adult lifespan, season and day, in order to develop pest management tactics that target reproductive behaviours such as pheromone-based monitoring, mating disruption or attract and kill technologies.

In June 2008, two black light traps were placed in Douglas-fir blocks at Kalamalka Research Centre (KRC), Vernon Seed Orchard (VSOC) and PRT. Females were trapped from 20 June to 17 August, 2008 (Fig. 1). *Dioryctria abietivorella* females mate multiple times and contained anywhere between 1-7 spermatophores. 96 of the 97 *D. abietivorella* females caught had mated at least once. Females may not disperse before mating and therefore virgin females may not be captured in light traps. If this is the case, light trapping may not be useful for tracking the seasonal flight of the entire population.

Male *D. abietivorella* adult flight was monitored weekly between 4 May to 30 September, 2008 using pheromone traps located in KRC, VSOC and PRT Douglas-fir blocks. Males were caught from 18 May to 21 September, 2008 (Fig. 1). Males are present and flying in late summer and early fall when no females were captured in the light traps. Because only mated females were captured, it is difficult to know if females have died off or are not mated and not captured in traps.

2. Calling behavior

Knowing when female *D. abietivorella* call within a 24-hour cycle and how calling changes with female age will allow managers to design and optimize integrated pest management techniques.

Females of different ages were placed in mesh-capped cups either in the field or in the laboratory, and observed hourly for several 24-hour periods for calling behaviour. Preliminary results indicate that a greater percentage of middle-aged females will call, followed by old and then young females (26%, 22% and 7% respectively). Calling was initiated anywhere between 30 to 560 minutes after dark and these extremes were demonstrated by young females. The mean onset of calling (minutes after dark) by age varied between trial dates making it difficult to draw any conclusions at this point. Calling duration ranged between 30 to 540 minutes and, with the exception of these extremes, female calling duration did not appear to vary widely among age groups.

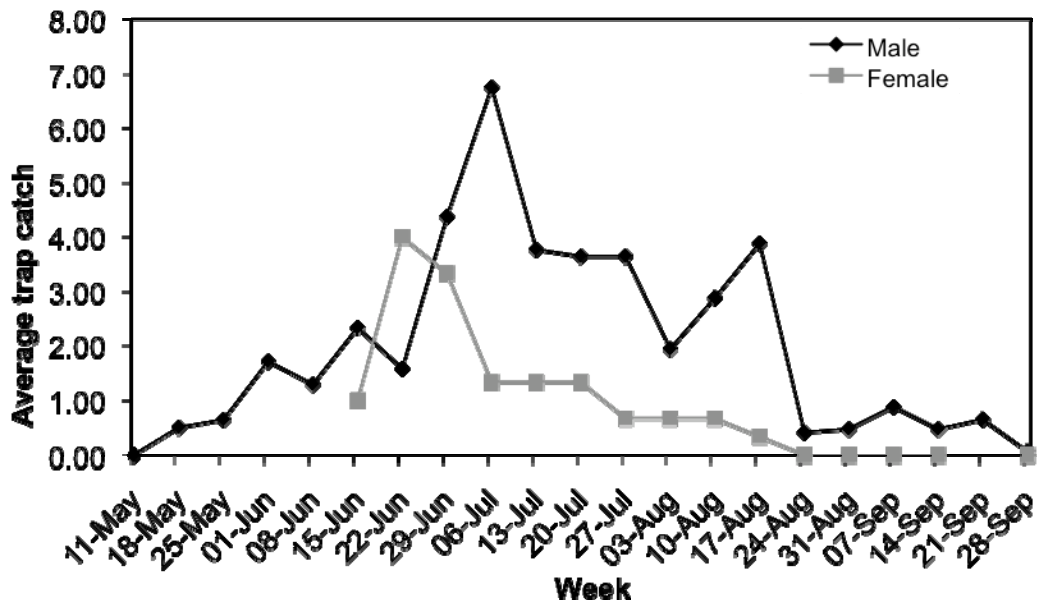


Fig. 1. 2008 seasonal flight of male and female *Dioryctria abietivorella* in British Columbia. Males were caught using pheromone-baited diamond traps and females were caught using UV light traps. Data is compiled trap catches at 3 sites conducted between 5 May and 30 September, 2008. Trapping was conducted in Douglas-fir blocks at the Kalamalka Research Centre, Vernon Seed Orchard and PRT in the Okanagan Valley, British Columbia.