

SUMMARY-PHD RESEARCH

The lingonberry or partridgeberry, *Vaccinium vitis-idaea* L. var. *minus* Lodd, is a low-growing ericaceous shrub, which produces edible berries that ripen in Newfoundland in mid-September. *Grapholita libertina* Heinrich, the lingonberry fruitworm, is a tortricid moth whose larvae feed within the lingonberry fruit.



The objectives of this study were to identify sex attractants for *G. libertina* and to evaluate its use in monitoring and controlling populations in wild Newfoundland lingonberry fields. A synthetic sex attractant was developed from among chemicals attractive to other *Grapholita* species and tested in 1997 to monitor *G. libertina* populations. Identification of this attractant led to a series of questions. Could this attractant prove useful in estimating future larval infestations? What would be the most effective delivery system for this attractant? Could field trapping accurately predict flight? How similar is the synthetic male attractant to the naturally occurring female produced pheromone?

Field trials were conducted with the sex attractant in 1998, 1999 and 2000 to correlate the adult trapping rate with the subsequent densities of larvae and damaged berries to examine the effects of berry distribution and heterogenous vegetation coverage in the wild.

Trials in 1999 were conducted to determine the most effective trap design for monitoring *G. libertina*. The efficacy of mass trapping using sex attractants of *G. libertina* was tested in 2000 as a potential control measure. In addition, information on population trends and phenology of *G. libertina* were examined through recording of the flight season, degree day accumulations and population size. Field-collected *G. libertina* were reared in order to identify the naturally occurring female sex pheromone. Solid phase microextraction was used to collect insect effluvia and gas chromatography-mass spectrometry attempted to identify pheromone components and relative amounts in the pheromone blend.



The results of this study indicated that a blend of: 85% E-8-dodecen-1-ol acetate, 10% Z-8-dodecen-1-ol acetate, and 5% Z-8-dodecen-1-ol was a suitable synthetic sex attractant for male *G. libertina*. The adult capture rate in Pherocon 1C® wing traps was correlated with subsequent larval and damaged berry density in wild fields. Berry densities were important in determining the distributions of larvae and damaged berries when berry levels were low (1999), perhaps indicating that a limited or patchy host berry distribution affected

female oviposition. Heterogenous vegetation present at study sites showed no significant effects.

The Pherocon 1C® wing trap was the most effective for use with the 85:10:5 blend. Mass trapping indicated a possible disruption of mate location by *G. libertina*, however no significant decrease in larval populations was noted. As a result of trapping, it was established that the adult male flight season extends over 6 weeks from late June to early August. The number of degree days above base 5 C required for 10% emergence was recorded as 270 ± 20.5 by rearing, and 334 ± 8.1 by field trapping. Identification of the female sex pheromone by gas chromatography-mass spectroscopy was not successful.