

Biological Control

USE OF INSECT PATHOGENS FOR CONTROL OF CODLING MOTH AND OTHER LEPIDOPTERAN PESTS OF APPLE IN THE PACIFIC NORTHWEST OF THE UNITED STATES

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Keywords: insect pathology, microbial control, entomopathogenic nematodes, *Steinernema* spp., *Bacillus thuringiensis*, apple, granulovirus, codling moth, leafrollers

Control of insect pests of apple in North America has traditionally been accomplished using conventional chemical pesticides. Codling moth (CM), the primary pest insect of apple in the Pacific Northwest of the USA, has routinely been controlled with organophosphate insecticides. However, the use of conventional insecticides will be severely reduced in the near future due to implementation of the Food Quality Protection Act. Alternative interventions, such as the use of CM sex pheromone to disrupt mating (MD), will require low population densities of the moth in order to be effective. The use of microbial control agents could reduce CM population densities and complement MD while conserving beneficial insects. For the most part, microbial control of fruit tree pest insects has been underutilized. The combination of MD with the CM granulovirus (*CpGV*) and entomopathogenic nematodes (EPNs) offers promise for effective control of CM. The potential of *CpGV* for control of neonate larvae has been demonstrated by numerous researchers (Cross et al., 1999), but the virus has not been routinely used in the USA. Overcoming problems associated with UV sensitivity will increase the attractiveness of *CpGV* to growers. The potential of EPNs for control of prepupal stages of CM has been elucidated by several authors (Kaya et al., 1984; Lacey and Chauvin, 1999; Lacey et al., 2000), but implementation in orchards will depend on keeping nematodes moist for six or more hours after application (Lacey et al., 2000).

One consequence of the MD strategy has been the release of some secondary pests such as leafrollers that were incidentally controlled with conventional insecticides used for CM control. *Bacillus thuringiensis* is regularly used in the Pacific Northwest for control of leafrollers, principally *Pandemis pyrusana* and *Choristoneura rosaceana*. The residual activity of *Bt* is relatively short, necessitating reapplication. The recent discovery of a granulovirus in *P. pyrusana* (R. Pfannenstiel, unpub.) and a nucleopolyhedrovirus *C. rosaceana* will provide additional microbial options for control of these pests.

References cited

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Unruh, T. R. and L. A. Lacey. 2001. *Biol. Contr.* 77: *in press*.