

Section III.
Biological and Cultural Control

ADVANCES IN THE CONTROL OF THE CHERRY BARK TORTRIX, *ENARMONIA FORMOSANA* (SCOP.) (LEPIDOPTERA: TORTRICIDAE)

T.A. Murray & L.K. Tanigoshi
Dept. of Entomology
Washington State University
Vancouver Research & Extension Unit
Vancouver, WA 98665
360/576-6030
tamurray@coopext.cahe.wsu.edu

DISTRIBUTION

In 1999, CBT flight activity was monitored in three counties: King, Lewis and Thurston County. Five traps were maintained weekly in each county. Flight was delayed two to three weeks due to weather conditions, this season. A strong bimodal pattern was observed at most trap sites resembling data collected in 1997. However, peak flights were constant to 1997 data even though flight was delayed this year. This bimodal pattern is also consistent with past data from British Columbia, Canada and Europe.

CBT movement was also tracked Southward and Eastward. Lower Lewis and Cowlitz counties were trapped during the peak flight period of August. No movement has occurred since last year; Centralia still is the most southern range of CBT. Snoqualmie Pass was also trapped during this time to track Eastward movement. Positive traps were collect as far East as North Bend, approximately 25 miles from the pass's summit. Population establishment eastward and southward occurs very slowly. Since the time that Eric LaGasa, Washington State Department of Agriculture, CBT has expanded its range from Thurston County to Lewis County. This expansion essentially took five years to cover a 30-mile distance. The significance of this maybe potentially great; this is the first establishment outside of the Puget Sound's environs.

CONTROL OF CBT
Chemical control of CBT

The use of chemicals to control CBT in the larval stage, locally, now appears to have realistic potential. Timing of pesticide applications was experimented with in the 1999 season. In 1998, an early season, pre-flight application was made. These trials gave good control of CBT with a range of registered products. In 1999, a mid-summer application was made just prior to peak flight and then an early fall treatment was tested approximately one month post fight. Applications were made following the protocols established of prior seasons. Control during the mid-season, prior to the second peak of flight activity, is not a desired time to apply treatments. Even the hardest-impacting

chemicals had a lower effect on CBT larval mortality. Late summer, early fall applications provided excellent control. During the fall of 1998, three trees were treated with either Topcide® or Dursban® in the first week of October. Thus far, this application has provided 100% control of CBT and appears to have a long residual affect. The trees were either not re-colonized quickly or the pesticide has a long enough residual effect on the hatching 1st instar larvae. We have observed residual effects of pesticides on later instars in 1998.

Natural enemies of CBT survey

Gary Platner, University of California-Riverside has determined the identification is of an important egg parasitoid of CBT as *Trichogramma cacoeciae*, a native solitary lepidopteran egg parasitoid. This species is uniparental, where males are rarely ever produced. Researchers in The Netherlands have found this species to be a good candidate for mass rearing and release. Most IDs require the presence of male representatives. Dr. Richard Stouthamer, Agricultural University-Wageningen, The Netherlands, sequenced DNA to positively ID the wasps. Arrangements are being made to make early season releases in the spring of 2000.

Parasitism rate

In 1997, two hundred individual cages, designed to cover and trap emerging moths and parasitoids, were placed in the field throughout the summer months. For the 1998 field season, 20 cages were placed in the field per week totaling 440. Total parasitism in the field was 1.7% in 1997; three traps yielded parasitoids. Total parasitism in 1998 was 2.1%. Most parasitoid activity occurred in mid-July. In 1999, 15 cages were placed weekly, however vandalism was very high. To date, only 4 specimens were recovered: 3 specimens of *Pimpla hesperus* (Tow.) and one specimen of *Itoplectis quadriangulatus*. Non-vandalized cages still yielded only 2.8% parasitization in the field. Currently, specimens from prior years are being identified through the American Entomological Institute, Gainesville FL. Currently, an attempt is being made to rear these species at the NorthWest Biocontrol Insectary and Quarantine.

It is clear that currently no natural enemy endemic to the Pacific Northwest is offering any significant natural control of CBT populations. However, there does appear to be a rich native parasitoid complex attacking CBT and could have potential if enhanced. These preliminary studies are the starting point to understanding the current nature of CBT in North America and the potential impacts of any native or endemic parasitoids. Ultimately, it is recognized that the importation of new parasitoids, native to the homeland of the cherry bark tortrix, is the most rational and economic approach to bring CBT into balance if natural control cannot be achieved endemically in the Pacific Northwest.