

## Chemical Control/New Products

### Chemical Control of the Cherry Bark Tortrix, *Enarmonia formosana* Scop. (Lepidoptera: Tortricidae)

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Due to the asynchronous phenology of CBT, adult chemical control is not a viable option. Larvae also pose a problem when considering pesticides since they are protected inside the bark. Eggs appear to be the only exposed life stage but are also staggered throughout the season. Old World literature concerning the chemical control of CBT is vague and sparse. Little empirical evidence of efficacy of pesticides against CBT has been documented. The following data are an attempt to record pesticide efficacy against CBT eggs, larvae and adult oviposition.

#### **Egg Treatments**

Cages have been constructed to house 4 one-foot long cherry logs. There is one cage per treatment. Three mated females were allowed to oviposit in each cage until the entire egg load was laid. This was accomplished by setting female pupae into each cage and releasing field-collected males as they emerged. Logs were then treated with various pesticides, oils and mixes at the highest recommended rates. Chemical efficacy at 14 days post-treatment was evaluated. Efficacy was determined by counting the number of unhatched eggs, unsuccessfully hatched eggs and successfully hatched eggs. Pretreatment counts showed equal rates of oviposition between treatments. All treatments gave adequate to excellent control of CBT eggs. The mortality associated with unhatched eggs appeared to be a result of affixation by emulsifiable concentrates and oil formulations. Unsuccessfully hatched eggs were observed in treatments with wettable powder formulations; the larvae receive exposure to the pesticides as they chew through the corium of the egg.

#### **Ovipositional Deterrency Treatments**

For ovipositional deterrence studies, previously treated logs were exposed to mated CBT females to determine ovipositional deterrence. The same cages and same methods were used as in the egg studies mentioned above. Logs were then treated with various pesticides, oils and mixes at the highest recommended rates. Twenty-four hours after treatment, adults were caged with the sprayed logs. No significant ovipositional deterrency effects were noted in the data.

#### **Larval Treatments**

Heavily CBT-infested trees were field collected and sectioned into one-foot logs. Logs were randomly selected for pesticide treatment. Each treatment was replicated 5 times. After 10 days post-treatment, logs were dissected and larvae were recorded as dead or alive. Topcide®, Dursban® and DuraGuard® all offered excellent control of CBT larvae. Spinosad® and Asana® both gave adequate control while oil applications offered very little control. It is important to note that the timing of the applications was made during the stages that are the deepest in the bark. Late instars of CBT are found grazing on the inner cambium layer at this time of year.

Exposure to the treatments occurred during larvae visits to the frass tube. These later stages prepare the frass tube for pupation and maintain it diligently.

### **Pesticide Persistence**

Recent studies have found that many pyrethroids and other chemical classes persist for great lengths in treated wood. We want to determine how long a treatment will be effective for controlling CBT. CBT-free logs were treated with pesticides and allowed to sit in the environment elements. Logs selected were four feet long and one log was used for each repetition for each time interval, this was replicated four times. At 1-, 3- and 5-week intervals, the logs were infested with 25 field collected larvae. Larval mortality was determined 10-14 days after infestation for each time interval. The logs were dissected and live, dead and sublethally exposed larvae were recorded. The results reveal a significant amount of residual efficacy from Topcide®, Dursban® and its wettable powder formulation, DuraGuard®. At 1-, 3- and 5-week intervals, there is some larval mortality. However, most larvae appear to receive a sublethal dose that causes them to cease feeding and fat body mass is reduced. Eventually, these larvae will lose critical biomass and expire. Overall affects of the pesticides prove to control CBT well in some of the treatments.