

Mating Disruption/SIR

Oriental Fruit Moth and Peach Twig Borer on Cling Peaches

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There are two key insect pests in the cling peach orchard system, oriental fruit moth (OFM) and peach twig borer (PTB). Commercial products for controlling OFM with pheromone confusion have been available since 1989. About 20% of the growers have been using pheromone for OFM control. Many growers have been reluctant to use OFM mating disruption since they still had to spray for PTB, increasing the overall cost of control. In 1995, the first commercial PTB product for pheromone confusion became available. The goal of this project is to introduce mating disruption to growers and to demonstrate a complete mating disruption program in an effort to expand adoption and result in a reduction of insecticide.

In the first year of the project there were 16 cooperators with 10 in Sutter/Yuba and 6 in Butte Counties, representing 155 acres. Growers were encouraged to wait for first moth to make the first application of both OFM and PTB pheromone. Growers' first application of OFM was typically around March 1 and PTB around April 1. This date varied for each grower since it was based on first trap catch and weather conditions. The second application typically went up around June 1 and was for both OFM and PTB, so growers would not have to make a separate application a few weeks later for PTB. Following this protocol, the second PTB pheromone application could be early. Growers in the program used all three commercial OFM products including Isomate, Checkmate, and Hercon. The manufacturers' recommendations for the application rate and length of product were followed. Although growers were encouraged to put the pheromone high in the tree canopy, approximately two-thirds up in the tree, not all of them followed this recommendation, and pheromones were often in the lower parts of the tree canopy.

Methods

Demonstration blocks were around 10 acres in size; however, growers with small acreage were also included in the program. Whenever possible, a nearby "grower standard" was used for comparison. Weekly trap catches were started to pinpoint the biofix and continued throughout the season for both OFM and PTB. Shoot strike counts were made in each orchard at the end of each generation and coincided with the biofix of the next generation. This was done by counting total shoot strikes from 5 trees in each block. Each shoot strike was cut out and examined for live worms and species determination. Harvest data were completed by collecting a total of 500 fruits from each variety in groups of 100 from different locations in the orchard. Growers were asked to keep track of pheromone application costs and spray costs from the nearby commercial standard. This was done to get an idea of pheromone application costs and compare costs to a

sprayed orchard.

Results and Conclusions

There were problems with mating disruption for OFM this year and the pheromone traps were not adequate to predict this failure. Most of the growers who had to spray because of this failure had caught nothing in the traps in pheromone blocks. After the shoot strike counts were conducted at the end of the 1st generation of OFM (6/20), all orchards and blocks with over 5 shoot strikes per tree were sprayed. This included both experimental blocks, several orchards with Hercon pheromone, and several orchards with Consep pheromone. In the months of April and May, growers using Hercon's OFM product had problems with it blowing out of trees. This pheromone was replaced by the company with a new product using the same "bread clip" used on their PTB product in May. One grower who continually replaced the pheromone in April during the heavy windstorms did not have to spray. The experimental block comparing Hercon, Consep and UCD paraffin emulsion had to spray out all three products. All three products tested were placed low in the tree canopy. All the blocks that had to be sprayed had high OFM populations in trap catches. Growers who did not have to spray had low damage for both OFM and PTB except for the 2 blocks of late variety Sullivan. In the second Sullivan block, damage was on the outside trees, indicating migration into the orchard. The only damage in most blocks was from leafrollers.

It is easy to explain the failure of Hercon pheromone since it was blowing out of the tree. On examining the trees, only one-quarter of the pheromone was left in the tree. This allowed almost one month's time without adequate rate of pheromone. This has been remedied by Hercon, changing to the bread clip, which will not blow out in strong windstorms as it did this year.

The Consep pheromone failure was more difficult to explain. Some researchers feel that 19 g per acre of OFM pheromone is not adequate for high population orchards. Dr. Rice felt that it is important for the pheromone to be placed high in the tree. He also theorized that the unusually cold nights this spring were not allowing the pheromone to volatilize up into the tree, increasing the importance of pheromone placement high in the tree.

The PTB pheromone program was more successful, although the PTB populations were overall lower this year. When conducting shoot strikes we did see a few PTB worms, but we did not see any damage at harvest. Two demonstration blocks were on young trees known for being attractive to PTB. One block in its second leaf using Hercon PTB pheromone had no shoot strikes and the second block in its third leaf had less than one strike per tree (0.4) and had no PTB damage at harvest.

Our future recommendations are that growers new to mating disruption with high OFM population need to use a product with a higher load rate such as Hercon's OFM with a rate of 27 g and Isomate (400 per acre) at 30 g. Once growers' OFM populations are reduced from using mating disruption for a few years, they will be able to use lower rate products of pheromone. We will also recommend that the pheromone be placed high in the tree.

Preliminary results on application costs show the first application with 11 growers

reporting averaged \$12.98 per acre. The second application which was for PTB with 10 growers reporting averaged \$11.35 per acre. And the last application with both OFM and PTB averaged \$25.98 per acre with 4 growers reporting. For all three applications the range was from \$3.60 to \$42.97. A total application cost per acre average was \$50.31.

We also made general observations about the demonstration blocks. We also observed that growers in the program had more powdery mildew because they are not applying regular fungicides in their cover sprays. We will recommend that growers make an application for powdery mildew at petal fall or they can use a fungicide such as Benlate or Topsin that controls powdery mildew for their second brown rot spray. If mildew conditions such as cool nights and overcast skies persist, a second application in late April with wettable sulfur will be recommended for mildew and rust control. However, there were some problems in some orchards using mating disruption in 1995. Overall, these 16 demonstration plots show a complete mating disruption system is now possible.