

# Improving Codling Moth Mating Disruption Using New Technology

Matt Grieshop, Jay Brunner and Mike Doerr  
 Dept. of Entomology  
 WSU Tree Fruit Research and Extension Center

## Introduction

- ◆ Mating disruption (MD) has become an important pest management strategy for managing the codling moth (CM)
- ◆ Presently, MD is most effective in large blocks that under low CM
- ◆ Low dose pheromone dispensers (Scentry No-Mate Fibers and Hercon CM Flakes) and plant volatiles might improve MD in smaller blocks and/or under higher CM pressure



Codling Moth



Scentry No-Mate Fiber



Hercon CM Flake

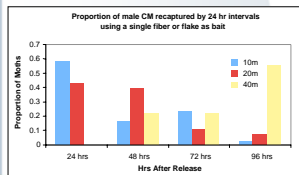
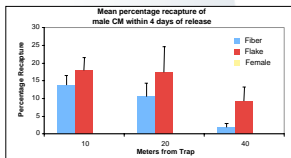
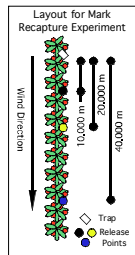
## Study Objectives

- ◆ Determine the active space of low volume pheromone dispensers
- ◆ Evaluate the affect of dispenser spacing on CM trap capture
- ◆ Explore the use of plant volatiles in combination with pheromone as a CM monitoring tool

## Active Space of Pheromone Dispensers

### I. Mark Recapture Study

- ◆ Male CM released downwind of single traps
- ◆ Traps baited with a female, a Scentry No-Mate Fiber, or a Hercon CM Flake

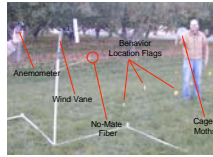


- ◆ CM caught 40 m from Fiber and Flake traps
- ◆ Flakes caught more CM than Fibers
- ◆ 40 m CM caught after 2 days

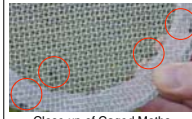
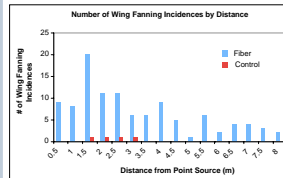
## Active Space of Pheromone Dispensers

### II. Field Observation

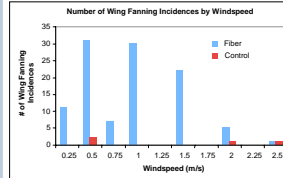
- ◆ Responses by caged male CM to a Scentry No-Mate Fiber at different wind speeds were recorded in the field



Field Observations of Caged CM



Close up of Caged Moths



- ◆ Males responded to the Fiber up to 8 m away
- ◆ Most responses at wind speeds between 0.5 and 1.5 m/s

## Arrangement of Pheromone Dispensers

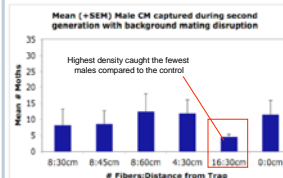
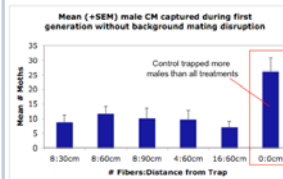
- ◆ 4, 8, or 16 Scentry No-Mate Fibers placed around a pheromone trap
- ◆ MD added for the second generation



Trap Surrounded by Fibers



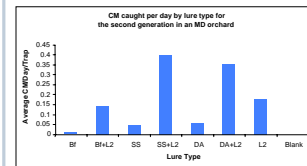
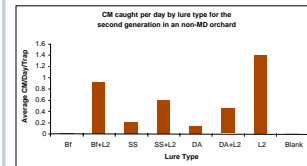
Close up of Fiber on Leaf



- ◆ Even the lowest density interferes with males in a non-MD orchard
- ◆ Only the highest density affected MD

## Plant Volatiles as Pheromone Synergists

- ◆ Two orchards; one with and one without MD
- ◆ 3 plant volatiles (PV) (Beta farnescene, SS, or DA) alone or with an L2 pheromone lure



- ◆ PV alone did not catch more moths than a blank in either orchard
- ◆ SS or DA added to an L2 lure caught more moths than an L2 lure alone under MD

## Summary and Conclusions

### Active Space of Pheromone Dispensers

- ◆ Hercon CM flakes and Scentry No-Mate Fibers have a 24 hr attractive range of between 10 and 20 m
- ◆ A single Scentry No-Mate Fiber can be detected by male CM from a distance of at least 8 m
- ◆ Low volume pheromone dispensers have a probable active space of between 8 and 10 m

### Arrangement of Pheromone Dispensers

- ◆ Even a low density of Scentry No-Mate Fibers (4 within 60 cm) reduced trap capture compared to no fibers in an orchard lacking background mating disruption
- ◆ Only a very high density of Fibers (16 within 30 cm) reduced trap capture in an orchard with background mating disruption

### Plant Volatiles as Pheromone Synergists

- ◆ Plant volatiles may provide additional attractiveness to traps monitoring CM in orchards under MD