

Mating Disruption/SIR

Effects of Male Density and Mating Disruption on Codling Moth and Obliquebanded Leafroller
Mating in Wind Tunnels and Field Cages

Nik G. Wiman, Vincent P. Jones and Jay F. Brunner

Washington State University Tree Fruit Research and Extension Center, Wenatchee, WA

Keywords: codling moth, *Cydia pomonella*, obliquebanded leafroller, *Choristoneura rosaceana*, mating disruption, density dependence

Abstract: The effect of male density and mating disruption on mating success of codling moth and obliquebanded leafroller was examined in laboratory wind tunnels and in field cages. In each experiment, males of each species were released concurrently at densities of 1, 2, or 3 males per virgin female. Calling and mating behavior was either filmed or observed, and all females were dissected to determine mating status. Lab wind tunnels consisted of mylar-walled boxes with a vertical (top-bottom) oriented airflow. Inside the cages, a single virgin female CM and OBLR was tethered onto the upper leaves of live foliage. Males for each species were released in the bottom of cages at dusk, and infrared video was used to film females. After baseline data were collected at each male density, we simulated mating disruption by applying a grid of 9 red septa lures per species on the mesh ceiling of each cage and trials were repeated. Lure loads were varied to simulate a spectrum of MD rates. In our field cage experiments, one group of cages received a MD treatment (hand-applied dispensers within the cage and on surrounding trees), while the other group was left untreated as a control. Virgin females were placed high on the trees within the cages inside mating tubes, while males were released onto sucker growth near the base of the trees. Females were monitored for four successive nights to monitor calling behavior, mating, and mortality. Results of these studies demonstrated the importance of scale to density dependent mating. Male density had quite a different effect on CM and OBLR mating success in the wind tunnels vs. the field cages. In both experiments, the addition of MD, even at a reduced rate, caused a two-fold decrease in mating from control values.