Mating Disruption/SIR

High Load Lures in Pheromone Block Monitoring

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Summary: Monitoring is difficult in orchards treated with mating disruption (MD) for CM control with pheromone traps. The normal trap loaded with a red rubber (RR) septum loaded with 1 mg of codlemone is essentially ineffective. The RR lures containing 10 mg of CM pheromone, "super-lures" (SRR), have shown promise as monitoring tools in MD orchards. However, research in 1994 showed that the SRR lasted, at most, only 20 days. New high load-rate lures were also tested in 1994 by utilizing portions of pheromone dispensers. One-quarter of a matrix-type pheromone dispenser (TNO) and one-half of a Hercon mating disruption tape (DT) dispenser were used in pheromone traps to monitor CM in MD orchards. A trap baited with a TNO lure consistently captured as many or more CM over a 49-day period as a trap baited with an SRR changed every 10 days. The DT lure lasted only about 19 days. As a result of this research, companies producing pheromone lures for monitoring are designing new high load-rate lures for monitoring CM in MD orchards. New lures should be ready for testing in 1995.

High Load Lures—Pheromone Block Monitoring

Experimental design. Four kinds of pheromone lures were compared for effectiveness in monitoring CM in pheromone-treated orchards. Two lures were commercially available products, an RR loaded with 1 mg of codlemone (Trécé, Inc.) and an SRR loaded with 10 mg of codlemone (Trécé, Inc.). The other two lures consisted of portions of two mating disruption products, one-half of a Hercon tape (DT) and one-quarter of a TNO dispenser. These modified dispensers contained approximately 20 mg of codlemone. The SRR and DT were compared during the first generation CM flight, while the SRR, RR, and modified TNO dispenser were compared during the second generation flight. To determine the effect of field aging on attractiveness of lures, an SRR was replaced every 10 days to use as a control in the comparisons. The experimental design was a randomized complete block (seven blocks). The number of male moths captured in Pherocon 1CP traps baited with the different lures was recorded every 2-3 days. To minimize position effects, traps were rotated each time they were inspected. Trap bottoms were replaced after a cumulative catch of 40 moths, more often if dirty.

The relative attractancy of the various lures during the first and second generation flights of CM is shown in Figs. 1 and 2. First generation data are presented as the average moth capture in traps baited with the "control" lure (super lure changed every 10 days), shown as a value of 1 (broken line), and average moth capture in traps baited with other lures shown as moth catch relative to the "control" lure. Second generation moth captures were consistently low; thus, absolute values were used in comparing lure performances during this test period.

First generation comparison. The aged SRR and DT lures captured the same relative number of moths as the non-aged SRR lure during the first 19 days of the test. A significant

reduction in the attractancy of both lures relative to a new SRR lure was recorded during the third 10-day period, as well as the remainder of the 49-day comparison. Codling moth activity level could be underestimated by as much as 50% if either lure was not replaced at three-week intervals during the first generation CM flight.

Second generation comparison. The SRR and TNO lures were equally attractive during the first nine days of the second generation CM flight. Subsequently, however, the effectiveness of the SRR lure declined dramatically, with no moth catch recorded after 19 days of field exposure. The attractancy of the SRR lure was maintained if it was replaced every 10 days. Effective use of the SRR lure in commercial orchards probably requires changing lures every two weeks during the second generation CM flight. The TNO lure had a significantly greater field life. Throughout the 49-day trapping period, moth captures in traps baited with the TNO lure were equivalent to catches recorded in traps baited with new RR (Fig. 2). The 1 mg RR replaced every 10 days was a poor lure throughout most of the flight.

The rate of pheromone release from high load lures is currently being determined. Lures were collected at 10-day intervals during both CM flights. Relating pheromone emission rates to field performances of lures should lead to the development of high load lures that are highly attractive to CM in the spring and summer and for a period of time that is commercially acceptable, four or more weeks.

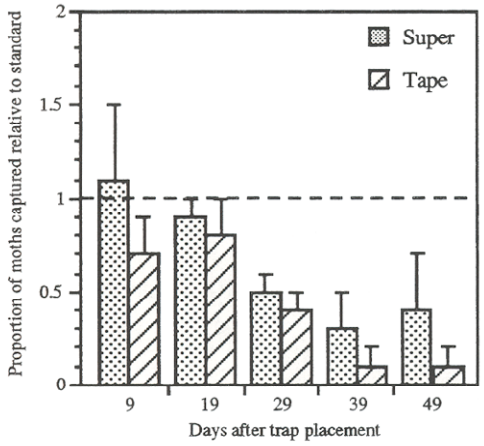

Fig. 1. First generation capture of CM males in pheromone traps baited with an SRR lure (10 mg Trécé red septa) or DT lure (modified Hercon dispenser tape) relative to an SRR lure replaced every 10 days (broken line).

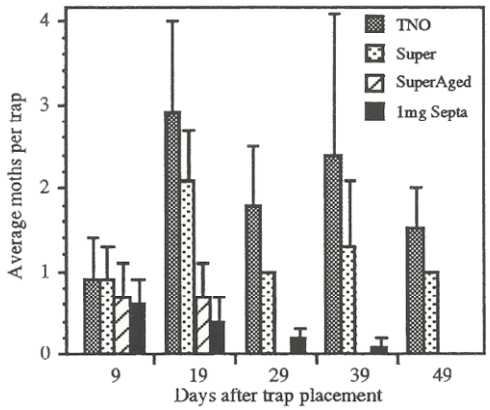

Fig. 2. Second generation capture of CM males in pheromone traps baited with an SRR lure (10 mg Trécé red septa), TNO lure (modified TNO dispenser), 1 mg RR (Trécé) replaced every 10 days, or an SRR lure replaced every 10 days.