DEVELOPMENT OF A NEW PHEROMONE DISPENSER FOR THE BOLL WEEVIL

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Abstract

Eradication programs against the boll weevil, *Anthonomus grandis* (Boheman), rely on weekly inspections of pheromone traps to detect incipient boll weevil populations and to indicate the need for insecticide treatments. Programs typically use lures dosed with 10 mg of grandlure (synthesized boll weevil pheromone) and replace lures in traps on a bi-weekly schedule during the active stage of eradication. Our prior research indicates that nearly 80% of the total pheromone released from commercial lures is emitted during the first week of use in traps. Given the relatively small amounts of pheromone released from lures during the second week of use, there is concern that detection of weevils with traps may also be reduced during this period. Although increasing the initial grandlure content of lures would increase the weekly amounts of pheromone released from lures, this approach is cost-prohibitive because the cost of grandlure has nearly doubled over the past several years. Perhaps a more economical and effective approach is to develop a pheromone dispenser that releases grandlure in a uniform or controlled manner over time. In collaboration with Scentry Biologicals Inc., research efforts were initiated in 2012 to develop a pheromone dispenser based on the company's patented "controlled release" technology. Several prototypes were developed and evaluated in subsequent years to profile the rate of pheromone released from the dispensers under a broad range on environmental conditions. Based on those results, the most promising prototype was selected for a trapping evaluation in 2015. Thirty and 58 pairs of pheromone traps were established in Tamaulipas, Mexico, and in the Lower Rio Grande Valley (LRGV) production area of Texas, respectively. One trap in each pair was baited with a prototype lure and the other paired trap was baited with the standard 10-mg pheromone lure currently used by eradication programs. The traps were inspected weekly and lures were replaced biweekly. Analysis of the initial pheromone content of lures revealed that the standard lures contained, on average, 3 mg more grandlure than the prototype lures (13.5 versus 10.5 mg). Despite this substantial difference in initial pheromone content, traps baited with the prototype lures captured as many boll weevils as those baited with standard lures during the first weekly trapping period at both locations. In fact, traps baited with the prototype lure captured significantly more boll weevils than those baited with standard lures during the second weekly trapping period at both locations. The difference in weevil captures during the second weekly trapping period is likely related to the rate and amounts of pheromone released from lures during that period. In light of these promising findings, a large-scale trapping evaluation of the prototype lure is planned for 2016.

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