

Mating Disruption/SIR

Pheromone-Based Control of Tree Fruit Pests in Michigan, 1998

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Several hand-applied and sprayable mating disruption products were evaluated for their ability to control codling moth, oriental fruit moth, leafrollers or peachtree borers in apple, peach or cherry. All hand-applied products were polyethylene tube dispensers, generically called Isomate (Pacific Biocontrol, Inc.). Isomate-C Plus was applied for codling moth control at rates of 200 to 400 dispensers per acre (d/a). Isomate M100 was applied for oriental fruit moth control at the labeled rate of 100 d/a. Isomate CM/LR, a product that is loaded with both codling moth and leafroller pheromone, was applied for control of this pest complex at the recommended rate of 400 d/a. Isomate LPB and PB were applied for lesser and/or greater peachtree borer control at rates of 100 d/a. Isomate C Plus and CM/LR dispensers were placed in the upper third of the canopy, while all other dispensers were placed at mid-canopy. All sprayable products were experimental microencapsulated (MEC) formulations manufactured by 3M Corporation. MEC sprayable pheromone was applied at rates of 10 or 20 g AI per acre for leafrollers, 7.5 or 15 g AI per acre for oriental fruit moth, 10 or 5 g AI per acre for greater peachtree borer, and 10 g AI per acre for lesser peachtree borer.

Direct comparisons of various combinations of mating disruption products, selective insecticides, and broad-spectrum insecticides for control of apple pests were conducted on twelve farms. A total of 37 orchards comprising 239 acres of apple were included in the project. Capture of males in pheromone traps, larval densities and levels of fruit injury were used to evaluate the effectiveness of pest control in test orchards. Isomate C Plus or CM/LR, either used alone or in combination with a reduced OP program, provided excellent codling moth control. A mean capture of 1.0 moth per trap was recorded in the 13 pheromone-treated blocks. This was substantially lower than the mean catch of 11.9 moths per trap recorded in the 17 blocks located on the same farms that were not treated with codling moth pheromone. Codling moth damage at harvest was recorded in only two of the thirteen orchards relying on mating disruption and a few organophosphate insecticide sprays. In contrast, fruit injury was recorded in half of the insecticide-only comparison orchards.

All orchards treated with leafroller disruption products also received at least one application of a selective insecticide (tebufenozide, spinosad, or *Bt*) to assist in controlling this pest complex. The combination of pheromone plus insecticide proved to be a relatively effective leafroller management program. Fruit injury at harvest was consistently lower in pheromone-based, selectively managed orchards than in comparison orchards not treated with pheromone and relying on conventional insecticides for leafroller control. A mean fruit injury level of 1.1% was recorded in the leafroller disruption blocks. This was substantially lower than the mean fruit injury level of 2.9% recorded in the 6 blocks located on the same farms that relied entirely on conventional insecticides for leafroller control.

Close to 600 acres of peaches on over 20 farms in west central Michigan were treated with Isomate M100 or MEC-OFM for control of oriental fruit moth. Approximately half of the acreage was also treated with pheromone for control of peachtree borers. All pheromone application greatly inhibited moth capture in pheromone traps and provided good control of oriental fruit moth and peachtree borers.