

Mating Disruption/SIR

Areawide Codling Moth Management in the Okanagan-Kootenay Sterile Insect Release Program, 1999

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Following extensive review and conditional endorsement by the fruit-growers last winter, the Program altered course and changed mission from eradication to "achieve and maintain areawide suppression of codling moth below economic levels in commercial orchards," as recommended by an external Technical Advisory Committee. A Grower & Industry Advisory Committee also recommended that it "improve the mandate from short-term measures of eradication to a longer-term integrated program." The Program operated in two areas in different intensities: Zone 1 (7,400 acres of commercial pome fruits) comprised of part of the Okanagan Valley, the entire Similkameen and Creston Valleys. It received pheromone traps at 1 per ha, orchard monitoring and visual inspection, sample tree banding in all sites, damage samples in all orchards (1,414) and in all urban habitats. The aim was reduction of moths in orchards via mating disruption, SIR, insecticides where required, and banding programs, and included a major urban program in 6,050 sites. The second area, Zone 2 (5,000 commercial acres), received extensive tree removal, pheromone trapping at 1 per ha, some orchard monitoring and visual inspection, some sample banding (5,000), some damage assessments (500), and was aimed at reduction of moths, by chemicals of grower choice, to a level permitting introduction of SIR moths next year. Also, several "implementation trials" occurred on 10 acre blocks each to demonstrate the effects of soft technologies (SIR, mating disruption) in comparison with a typical insecticide program, and we funded urban and orchard research work using Last Call (Sirene). There also was a small urban program. Zone 3 (3,000 acres, northern area) received no attention in 1999.

The cool and rainy spring weather resulted in low numbers of codling moth throughout the SIR Program area in the first generation. The numbers of codling moths in commercial orchards and in urban areas, and proportion of each type of site showing any codling moth, were again below previous levels in Zone 1 (e.g., Figure 1), and analysis of male catch in traps, damage at harvest, or larvae in tree bands, revealed significant differences across Zones. Zone 1 traps averaged 0.09 wild moths per trap per week. By comparison, in Zone 2 where SIR is in the third year of a clean-up campaign, the overall trap average was 2.20. Zone 3 averaged 4.15 moths per trap. Only 144 of the 3,221 pheromone traps in Zone 1 picked up more than 10 wilds in total all season and 59% of the traps did not catch any wild moths at all.

Harvest damage in Zone 1 was lower than that in 1998, at about the same level as 1997. Some 1.56% of Zone 1 commercial orchards had a level of economic damage due to codling moth (greater than 0.5%) as indicated by a random sampling of 1000 apples and/or pears per site; Zone 2 commercial orchards finished at 30.8%.

Some 240,429 cardboard bands were placed around trees season-long throughout 7,708 acres of apples and pears in Zone 1 to help identify remaining codling moth populations. 1,202 of the 1,429 sites did not capture any larvae and the average was .07 larvae per band.

A preliminary analysis of pesticide sales figures from the BC Ministry of Environment Lands and Parks also indicated that by 1999 the use of azinphosmethyl had been reduced 51% from a three year baseline for the period 1991-93 in Zone 1 where the full SIR Program operated, and by 26% in Zone 2, where merely orchard and urban clean-up, and tree removal, had occurred.

The careful and well-timed use of insecticides, principally azinphosmethyl, was the method of choice for almost all of the growers in Zone 2. However, comparison of the results over the last three years shows very little population reduction and significant damage each year. Hence, the Program is switching to employment of mating disruption throughout Zone 2, at 200 lures/acre together with grower-applied insecticide use, to achieve its goal of population suppression within five years. Some 2-3 years are expected to be necessary until damage is reduced to near-zero. In Zone 1, codling moth populations are extremely low in many sites. Hence, for the next two years, some examination of the most cost-effective choices for long-term management will occur, including comparisons of the minimal mating disruption and SIR regimes which could be pursued, and whether or not sales of SIR moths to American orchardists would offset any reduced rearing needs.

