

VII. Mating disruption/SIR

c. Chemical Control

1. Leafroller mating disruption on apple

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Sprayable pheromone: A sprayable leafroller pheromone and two fixed dispensers were compared in small plots for their effectiveness at disrupting attraction to virgin female-baited traps or pheromone traps baited with 1 or 10 mg loaded lures. The first test was conducted near MF in two non-bearing apple orchards. Two orchards were selected for the test, one (Rodighero) containing a low and one (Sunbay) a moderate population of obliquebanded leafroller (OBLR), *Choristoneura rosaceana*, larvae prior to the initiation of the test. The second test was conducted near Chelan where a moderate population of pandemis leafroller (PLR), *Pandemis pyrusana*, was present.

The Ecogen MEC-LR formulation was a micro-encapsulation of Z11-14Ac (200 g/liter), a main component of OBLR pheromone. The Ecogen spiral dispenser contained about 95 mg of Z11-14Ac (95.7%), and the Hamaki-con dispenser contained about 170 mg of Z11-14Ac (93%). The MEC treatments were applied with a handgun sprayer operating at 200 psi. Trees were sprayed in a manner to minimize runoff and drift. The Ecogen spiral dispenser was applied at a rate equivalent to 400 dispensers per acre. The Hamaki-con dispensers were applied at a rate equivalent to 400 dispensers per acre. Treatments were applied on June 2.

Moth capture in pheromone traps was used to monitor the effectiveness of treatments. Pheromone traps were placed in the orchard the same day as the treatments were made. One trap in each replicate contained a 10X lure, and the other trap contained either a 1X lure or a cage with a virgin OBLR female. Traps were checked every three to four days and position within the replicate rotated at each examination.

Pheromone traps with 10X lure captured the most LR moths, followed by the virgin females and then the standard lure in the pheromone treatments and in the untreated check. At both locations in OR there was no separation in pheromone treatments using moth captures in pheromone traps baited with the 1X lure (Tables 1 and 2). There was also no difference in the number of moths captured in virgin female-baited traps in pheromone treatments or the untreated check at the Sunbay orchard, but at the Rodighero orchard virgin female-baited traps captured significantly more moths than in the pheromone treatments. At Chelan there was a separation in pheromone treatments using moth captures in pheromone traps baited with the 1X lure (Table 3).

The clearest separation of pheromone treatments based on moth captures was found in traps baited with the 10X lures. The relationship between treatments was similar. Traps with 10X lures in blocks treated with the spiral (Rodighero or Chelan), Hamaki-con (Sunbay) and highest rate of the MEC formulation captured the fewest moths, followed by the two lower rates of the MEC formulation and the check (Tables 1, 2 and 3).

Table 1. Average obliquebanded leafroller moth capture in sprayable pheromone block at Rodighero, 1995.

Treatment	Average moth catch/lure/day		
	Virgin female	OBLR W	OBLR W10
MEC-3	0.13a	0.00a	2.75bc
MEC-12	0.00a	0.57a	3.88cd
MEC-48	0.27a	0.22a	1.63ab
Spiral	0.00a	0.11a	1.00a
Untreated	2.47b	0.22a	7.71d

Means in the same column followed by the same letter not significantly different ($p=0.05$, Fisher's Protected LSD). Statistics run on transformed data ($\log(y+1)$).

Table 2. Average obliquebanded leafroller moth capture in sprayable pheromone block at Sunbay orchard, 1995.

Treatment	Average moth catch/lure/day		
	Virgin female	OBLR W	OBLR W10
MEC-3	0.80a	0.56a	12.96b
MEC-12	1.40a	0.78a	10.21b
MEC-48	0.00a	0.22a	4.42a
Hamaki-con	0.00a	0.00a	2.63a
Untreated	2.47a	1.11a	20.33b

Means in the same column followed by the same letter not significantly different ($p=0.05$, Fisher's Protected LSD). Statistics run on transformed data ($\log(y+1)$).

Table 3. Average pandemis leafroller moth capture in sprayable pheromone block at Chelan, 1995.

Treatment	Average moth catch/lure/day	
	PLR-1	PLR-10
MEC-12	0.49a	2.41b
MEC-48	0.15a	1.10a
Spiral	0.34a	1.16ab
Untreated	1.74b	4.91c

Means in the same column followed by the same letter not significantly different ($p=0.05$, Fisher's Protected LSD). Statistics run on transformed data ($\log(y+1)$).

Application of the sprayable pheromone by handgun to non-bearing trees was considered a limitation in the study. The company has obtained a tolerance exemption for 1996 so that the pheromone can be applied with an airblast sprayer in low volume to larger trees. This technology appears promising enough to continue research in this area.