Mating Disruption/SIR

Integrating Sprayable Pheromones in Apple Orchards for Management of Leafroller Populations

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3M Canada microencapsulated leafroller pheromone (Z-11 tetradecenyl acetate) was tested at two rates and two timing intervals (same rate) during the spring and summer flight period at pandemis (PLR) and obliquebanded (OBLR) leafroller locations in Washington and Oregon. At four locations the sprayable pheromone was also compared to a hand-applied dispenser containing only leafroller pheromone during first flight. Evaluation of effect was based upon the capture of moths in pheromone traps baited with standard lures (1 mg) or lures with 10 times the standard pheromone load (10 mg). The size of treatment plots within an orchard ranged from 2.5-5.0 acres per treatment. Four pheromone traps baited with both lures were placed in each treatment, checked weekly (2 standard and 2 high-load lure-baited traps). In rate experiments the low rate of pheromone was 10 grams AI/acre and the high rate was 20 g AI/acre. Treatments were applied twice during the flight at intervals of 21 days. The application interval for timing experiments was 14 and 21 days using a constant rate of 20 g AI/acre. The applications at all locations were applied after some moth activity had already been detected, possibly reducing the full impact of the treatments. It was difficult to sort out the true impact of the pheromone treatments on larval populations since growers at all sites were allowed to apply control treatments according to their standard practice and these could have had the effect of reducing populations of leafroller larvae in all plots.

Leafroller sprayable pheromone showed a consistent reduction in overall trap catch for the obliquebanded leafroller in both tests, while there were less consistent results for the pandemis leafroller. Results indicate that for OBLR the higher rate of product delivered at 20 g AI/acre is preferred over that of the lower rate of 10 g AI/acre (Table 1). It also indicates that spraying at 2-week intervals for the duration of the flight is more effective than 3-week intervals (Table 2). Although there was consistent reduction in trap catch in many of the trials, there is no evidence of a reduction in larval populations using sprayable pheromone at 20 g AI/acre and/or at 2-week intervals (Tables 1 and 2). There did, however, seem to be a reduction in OBLR mating in treated blocks (Table 3). This alone may allow sprayable pheromone, in combination with other techniques, to play a vital role in leafroller management during first flight.

Table 1. Rate effect.

		Moths/trap		
Treatment	Lure	WVCC PLR	Maverick OBLR	Mattawa OBLR
1st flight				
Sprayable, high	1 mg	8.5	0.5	5.5
Sprayable, low	1 mg	41.0	4.0	68.5
Hand applied	1 mg	0.5	0.0	--
Untreated	1 mg	21.0	42.5	145.5
Sprayable, high	10 mg	17.0	1.0	16.0
Sprayable, low	10 mg	170.5	7.0	157.5
Hand applied	10 mg	5.5	0.5	--
Untreated	10 mg	30.5	128.0	220.5

Table 2. Timing effect.

		Moths/trap			
Treatment	Lure	Stemilt PLR	Lanphere PLR	Davis OBLR	Chapman OBLR
1st flight					
Sprayable 2 week	1 mg	40.5	34.5	0.0	2.5
Sprayable 3 week	1 mg	30.5	4.0	0.5	1.0
Hand applied	1 mg	11.5	--	--	0.0
Untreated	1 mg	18.5	9.5	2.0	14.5
Sprayable 2 week	10 mg	120.0	55.5	9.5	3.0
Sprayable 3 week	10 mg	131.0	40.5	26.5	0.0
Hand applied	10 mg	20.5	--	--	0.0
Untreated	10 mg	21.5	58.0	54.5	7.5

Table 3. Mating success.

	Average			
Treatment	Stemilt % mated	Stemilt % reduction	Mattawa % mated	Mattawa % reduction
1st flight				
Sprayable 2 week/low rate	33.12	-353.13	2.60	60.00
Sprayable 3 week/low rate	28.76	-12.30	0.00	100.00
Hand applied	4.94	82.61	--	--
Untreated	21.62		12.49	
2nd flight				
Sprayable 2 week	16.90	41.11	5.87	68.22
Sprayable 3 week	15.01	54.94	10.51	64.63
Untreated	35.01		23.46	