

Pome Fruits—Chemical Control

Apple Ermine Moth

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Apple ermine moth is an introduced pest from Europe which is currently under quarantine regulations in Washington. The regulations apply to nursery stock being shipped from infested areas. A pheromone is available for detection and has been used to establish the limits of the infestation. During the 1991 growing season, stock from infested areas was required to be treated with azinphosmethyl at 1 lb AI/acre at 2-week intervals. This spray application was directed at adult moths in order to prevent oviposition on the bark. This necessitated that insecticidal coverage be present during the moths' 10-week flight period (roughly early July through September).

This test was conducted with adult female AEM. Pupae were collected from infested sites in western Washington in July, left to emerge in cages, sexed, and shipped to Wenatchee. Moths were kept cool until the beginning of the bioassay. Freshly harvested, unsprayed and washed apple leaves were dipped in a concentration series of Guthion 35WP and allowed to air-dry. The dried leaves were wrapped around the interior of a shell vial (1-2 leaves/vial), so that the interior surface was entirely covered. Two adult female moths were introduced into each vial and evaluated at 24, 48, 72, 96 and 192 h post-treatment. Fifty moths were tested at each concentration. Moths which were injured during handling were dropped from the analyses. Both dead and moribund moths were included in mortality counts.

Check mortality was acceptable at the 24, 48 and 72 h evaluation, marginally acceptable at the 92 h evaluation, and unacceptable at 196 h evaluation. For this reason, the LC₅₀ and related parameters were not calculated for this time. Either a 72 or 96 h bioassay was considered appropriate for this organism and method. Although the estimate of the LC₅₀ dropped at each evaluation, there was little numerical difference between the 72 and 96 hr estimates. An LC₅₀ of 29.66 mg AI/liter corresponds to a per acre rate of 0.01 lbs AI; a typical application of Guthion is 1.00 lb AI/acre. The 96 h LC₉₀ was 100.49 mg AI/liter (67.64 to 209.5 95% fiducial limits).

In addition to the dose response bioassay, a field-aged residue bioassay was conducted in a commercial nursery near Quincy, WA. The trees were sprayed by airplane with azinphosmethyl at 1 lb AI/acre (7 gpa). The application was made on July 5, and leaves were collected from the field at 4 and 11 days post-treatment. The methodology is the same as described for the dose-response bioassay, except that both males and females were tested separately. The evaluation was made 72 h post-exposure. Abbott's corrected percent mortality at 4 days post-treatment was 100% for both male and female moths. At 11 days post-treatment, the figures were 36% and 58.33% for females and males, respectively. Mortality rose to 100% for both sexes 3 days after the second azinphosmethyl application (48 h data). It appears that gravid

females immigrating into a treated field ca. 1 week after treatment may not be killed by spray residues. Aerial application may have been a factor in poor residual control, or adults may not be particularly sensitive to azinphosmethyl. The LC₉₀ of 100.49 mg AI/liter corresponds to a field rate of 0.33 lb AI/acre, or one-third of the field rate.

mg AI/liter	Hours post-treatment									
	24 h		48 h		72 h		96 h		192 h	
	n	% mortality	n	% mortality	n	% mortality	n	% mortality	n	% mortality
600	49	97.96	48	100.00	48	100.00	48	100.00	48	100.00
300	50	66.00	47	85.11	47	91.49	47	97.87	46	100.00
150	49	61.22	50	86.00	50	96.00	50	98.00	49	100.00
75	50	56.00	50	70.00	50	76.00	48	89.58	48	95.83
37.5	46	28.26	49	44.90	49	53.06	48	54.17	47	78.72
18.75	49	20.41	49	28.57	48	33.33	49	42.86	47	61.70
0	49	0.00	49	2.04	50	4.00	50	10.00	48	43.75

Parameter	Hours post-treatment				
	24	48	72	96	196
LC ₅₀	81.23	42.86	33.98	29.66	--
Lower 95% FL	35.96	22.86	16.17	15.43	--
Upper 95% FL	156.76	65.16	52.75	43.45	--
Slope	1.41	1.69	1.93	2.42	--
S.E. Slope	0.17	0.20	0.24	0.35	--

Data were analyzed using probit option of POLO-PC (LeOra Software). FL=Fiducial Limits.