

Chemical Control/New Products

USE OF KAOLIN AND RAYNOX FOR SEASONAL CONTROL OF PEAR PSYLLA

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This study was conducted to determine the optimal timing for kaolin (Surround<sup>®</sup> WP, Englehard Corp), a kaolin clay-based product, and Raynox (Raynox LC, Solutec Inc. Yakima, WA), an organically modified clay in a waxy matrix, for control of pear psylla, *P. pyricola*, on pears. The following eight different treatment regimes were used in this study.

Treat.	Prebloom	Rate/ acre	Application dates	Postbloom	Rate/ acre	Application dates
1.	Untreated			Untreated		
2.	Surround <sup>®</sup> WP	50 lb	3/24, 4/3, 4/10	Agri-Mek + oil	20 oz	4/25, 7/11
3.	Thiodan <sup>®</sup> 3EC + oil Esteem <sup>®</sup> EC	3 qt 1 pt	3/24 4/3	Surround	50 lb	4/25, 5/9, 5/24, 6/6, 6/27, 7/21
4.	Surround <sup>®</sup> WP	50 lb	3/24, 4/3, 4/10	Surround	50 lb	4/25, 5/9, 5/24, 6/6, 6/27, 7/21
5.	Thiodan <sup>®</sup> 3EC + oil Esteem <sup>®</sup>	3 qt 1 pt	3/24 4/3	Agri-Mek + oil	20 oz	4/25, 7/11
6.	Raynox LC	200 gal	3/24, 4/3, 4/10	Agri-Mek + oil	20 oz	4/25, 7/11
7.	Thiodan <sup>®</sup> 3EC + oil Esteem <sup>®</sup>	3 qt 1 pt	3/24 4/3	Raynox	100 gal	4/25, 5/9, 5/24, 6/6, 6/27, 7/21
8.	Raynox LC	200 gal	3/24, 4/3, 4/10	Raynox	100 gal	4/25, 5/9, 5/24, 6/6, 6/27, 7/21

The first five treatments had plots which were 3 trees long by 3 rows long, replicated four times, and were sprayed with an airblast sprayer calibrated to spray 200 gpa prebloom and 100 gpa postbloom. The Raynox treatments consisted of single trees replicated four times. The treatments were applied using a handgun sprayer at 200 gpa. Raynox was used undiluted for prebloom and mixed 1:1 with water for postbloom sprays. Psylla adults were sampled by taking 4 beating tray samples per plot. Psylla eggs and nymphs were sampled by counting their numbers on 5 spurs per plot from 3/21 to 4/19. Counts after this time were made by selecting 50 leaves per plot, 25 from the lower canopy and 25 from the upper canopy, and brushing them with a mite brushing machine onto a glass plate, of which half of the area was counted. Data were subjected ANOVA and means separated using Student-Newman-Keuls at  $p=0.05$ . Overall seasonal means were separated using Post Hoc LSD.

### Results

First generation nymphs peaked in mid-late April and second generation peaked in late June-early July. When overall nymph means from both the upper and lower canopy were analyzed, the programs with Surround<sup>®</sup> and Raynox either full season or postbloom had lower numbers of psylla nymphs than the other programs or the untreated control. When both counts are combined and analyzed the trends are the same. Overall means of psylla egg counts from the upper canopy showed that the Surround<sup>®</sup> and Raynox treatments, full season or postbloom, had

lower numbers than the other treatments. Overall egg means in the lower canopy showed all of the treated plots, with the exception of the Surround<sup>®</sup> conventional, had fewer eggs than the untreated control. All of the treatments also reduced adult psylla numbers below those found in the untreated. From the results it appears that a season-long or a postbloom program of either Surround<sup>®</sup> or Raynox may be viable alternatives to conventional means for psylla control in pears.

**Table 1.** Pear psylla nymph counts in upper canopy of trees

Treatment	6/1	6/9	6/21	6/29	7/7	7/14	7/21	8/3	8/10	8/16	8/23	Mean <sub>UC</sub> <sup>a</sup>	Mean <sub>E</sub> <sup>b</sup>
Control	4.5 a	22.5 a	13 a	33 abc	24.5 ab	2.3 ab	10.8 a	17 a	1.8 b	3.5 abc	9 ab	12.89 a	7.642a
Surround <sup>®</sup> / Conventional	0.5 b	5.3 bc	10.5 ab	39.3 ab	14.8 abc	1 ab	7 abc	9.3 ab	7.3 b	6 ab	13 a	10.34 a	5.192bc
Conventional/ Surround <sup>®</sup>	1.3 b	1.8 bc	4 bc	11.3 bc	10.5 abc	1.8 ab	3 bc	0.8 b	1.8 b	0.8 c	0.3 d	3.364 b	2.634d
Surround <sup>®</sup>	1 b	0 c	0.5 c	9 bc	3.3 c	0.3 b	1.8 c	5.3 b	0 b	1 bc	0.8 cd	2.068 b	1.292d
Conventional	1 b	8.8 abc	10.8 ab	18.3 bc	12.3 abc	3.8 a	4.8 bc	6.5 b	17 a	8.5 a	8 abc	9.045 a	5.392b
Raynox/ Conventional	1 b	16 ab	13 a	59.5 a	29.3 a	0 b	7.3 ab	6.8 b	1.5 b	2.8 bc	5 bcd	12.91 a	6.409ab
Conventional/ Raynox	0 b	3.8 bc	6.3 abc	5.5 c	7.8 bc	1.5 ab	4.3 bc	4.3 b	1.5 b	1.3 bc	3 bcd	3.545 b	3.176cd
Raynox	0 b	1.3 c	2.5 c	12.3 bc	13.5 abc	0.5 ab	6.8 abc	1 b	1.3 b	1.3 bc	4.5 bcd	4.068 b	1.784d

Means within the same column followed by the same letter are not significantly different ( $p = .05$ , LSD).

<sup>a</sup>mean psylla counts in upper canopy through the season, from ANOVA over the entire season ( $p = .05$ , LSD post hoc test).

<sup>b</sup>mean psylla counts in entire (upper and lower canopy) tree through the season, from ANOVA over the entire season ( $p = .05$ , LSD post hoc test).

**Table 2.** Pear psylla nymph counts on lower canopy of trees

Treatment	4/6	4/12	4/19	4/28	5/11	5/19	5/25	6/1	6/9	6/21	6/29
Control	0.5 b	7.5 b	18.3 a	6 a	4.3 a	1 a	1.3 ab	1 a	5.8 ab	0.5 b	12.5 a
Surround®/Conventional	3 ab	0 b	0.5 b	0.5 b	1.3 b	0 a	0.3 ab	1.5 a	5.8 ab	3.3 ab	9.3 a
Conventional/Surround®	6 a	11.5 b	11.3 ab	1.8 b	1.3 b	1.5 a	0 b	1.5 a	1.8 ab	0 b	5.5 a
Surround®	1 b	0 b	0.8 b	0 b	0 b	3.5 a	1.8 a	0 a	0.5 b	0.3 b	8.8 a
Conventional	1.3 b	12.5 b	16.3 a	1.5 b	1.3 b	0.3 a	0 b	0 a	3.8 ab	4.5 ab	6 a
Raynox/Conventional	0.5 b	0.8 b	0 b	0 b	0 b	0 a	0.5 ab	0.3 a	6.8 a	6.3 a	17 a
Conventional/Raynox	0.3 b	37.5 a	10.3 ab	0.5 b	0 b	0 a	0 b	0.3 a	1.8 ab	0.3 b	2.5 a
Raynox	0 b	0 b	2.3 b	0 b	0 b	1.5 a	0 b	0.3 a	0.8 b	0 b	3.8 a

**Table 2.** (cont'd)

Treatment	7/7	7/14	7/21	8/3	8/10	8/16	8/23	Mean <sup>a</sup>
Control	5.5 ab	7 a	4.8 a	2.3 a	1.8 ab	2.5 a	7.3 a	4.614 a
Surround®/Conventional	6.8 ab	3 ab	0.8 b	1.5 ab	2 a	2.5 a	7 a	3.932 b
Conventional/Surround®	2.8 b	2 b	2 ab	0.5 bc	0 c	0.5 a	0.5 b	1.545 c
Surround®	2 b	1 b	0 b	0.3 bc	0.3 bc	0.8 a	1 b	1.341 c
Conventional	3.3 b	0.8 b	1.3 b	0.5 bc	1.3 abc	2.3 a	4.3 ab	2.523 c
Raynox/Conventional	14.8 a	1 b	1.8 b	1.3 abc	1 abc	2.3 a	1.5 b	4.886 a
Conventional/Raynox	3 b	0.3 b	0.5 b	0 c	0 c	1.3 a	0 b	0.8864 c
Raynox	0.8 b	2.3 b	0.5 b	0.3 bc	0.3 bc	0 a	0.3 b	0.8182 c

Means within the same column followed by the same letter are not significantly different ( $p=.05$ , LSD).

<sup>a</sup>mean psylla counts in lower canopy through the season, from ANOVA over the entire season ( $p=.05$ , LSD post hoc test).