

PEAR: *Pyrus communis* L., 'Bartlett'**Chemical Control of Pear Psylla in Pear, 2018****Louis Nottingham,^{1,*} Robert Orpet, Bruce Greenfield, and Elizabeth Beers**

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Pear | *Pyrus communis*Pear psylla (PP) | *Cacopsylla pyricola* (Förster)

The objective of this study was to assess efficacy of soft insecticides for control of PP in pear. This study was conducted within a 2-acre block of mature pear trees planted in 1972 at the Washington State University Tree Fruit Research and Extension Center in Wenatchee, WA. The block was maintained to commercial standards via weed control, disease and nutrient sprays, pruning, under-tree sprinkler irrigation, and was sprayed prior to this study with Surround CF (kaolin clay) at 50 lb/acre for early-season PP management. The first spray for this study occurred at petal fall on 7 May 2018. There were six treatments (including an untreated check) with four replications organized in an RCB design. Each treatment was a program with four total sprays, each applied weekly. All spray plots consisted of three consecutive trees in the same row, and plots were separated by at least one untreated buffer tree. All sprays were applied using an airblast sprayer (Pak-Blast, OVS McMinnville, OR) at 200 gpa. Insect sampling began with a pretreatment count on 29 Apr. Samples were taken from the center tree of all plots; all sampled trees were 'Bartlett'. PP eggs and nymphs were counted weekly from 29 May to 13 Jun by collecting 25 leaves per tree and brushing insects onto a revolving glass plate coated with undiluted dishwashing liquid. The composite sample was counted under a stereoscopic microscope. Adult PP were sampled with beating tray in the field. Each replicate received four 'taps' per replicate. One tap refers to a subsample that entails three consecutive strikes with a hard rubber hose on a branch, dislodging insects onto a 45- × 45-cm tray. The number of PP adults falling on the tray were recorded for each tap, and the average per replicate (four taps) was used for analyses. Data were analyzed with using PROC GLIMMIX in SAS. Response variables were PP eggs, early instars (1st–3rd), late instars (4th and 5th), and PP adults.

Mean-response variables within each sample date were analyzed by ANOVA. When there were significant treatment effects ($P < 0.05$), means were separated using Tukey's HSD. Seasonal means were the averages of all sample dates, excluding the pretreatment on 29 Apr. Differences among seasonal means were analyzed with repeated measures ANOVA. When there were significant treatment effects ($P < 0.05$), means were separated by using Tukey's HSD.

All spray treatments significantly suppressed PP relative to the untreated check, although effects were variable for different life stages (Table 1). Prior to the first spray date on 7 May, PP eggs, early instars, and adults were present and had similar mean counts between treatment plots, whereas late instar PP were not present. In the checks, PP life stages tended to increase in abundance throughout the study. Some treatments reduced this increase for certain life stages. For PP eggs, no differences were observed among treatments and the check at individual sample dates; however, Cinnerate had significantly fewer eggs than the check for the seasonal mean. For PP early instars, no differences were observed on individual sample dates, but all treatments except CX-10282 had significantly lower seasonal means than the check. For PP late instars, all treatments had significantly lower PP late instars than the check for the seasonal average, and all treatments except CX-10282 were lower than the check on 4 Jun. All treatments had significantly lower PP adults at seasonal means than the check, and no differences occurred on individual sample dates.

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Table 1.

Treatment/formulation(s)	Rate/acre	Application dates ^a	Avg. PP eggs/brushed leaf							
			29 Apr	8 May	16 May	25 May	30 May	4 Jun	13 Jun	Seasonal mean ^b
CX-10282	32 ^c	ABCD	0.37	0.06	0.00	0.05	0.24	0.54	0.28	0.20a
Cinncerate	15 ^d	ABCD	0.09	0.06	0.01	0.02	0.17	0.17	0.19	0.10b
AzaDirect; Employ	24 ^e ; 2 ^f	ABCD; AD	0.15	0.10	0.02	0.07	0.24	0.35	0.34	0.19ab
Cinncerate; AzaDirect	15 ^d ; 24 ^d	AC; BD	0.09	0.01	0.00	0.16	0.04	0.40	0.26	0.14ab
AzaDirect	24 ^d	ABCD	0.02	0.10	0.03	0.06	0.23	0.26	0.23	0.15ab
Untreated check	–	–	0.06	0.03	0.06	0.07	0.30	0.44	0.33	0.21a
Treatment/formulation(s)	Rate/acre	Application dates ^a	Avg. PP 1st–3rd instars/brushed leaf							
			29 Apr	8 May	16 May	25 May	30 May	4 Jun	13 Jun	Seasonal mean ^b
CX-10282	32 ^c	ABCD	0.30	0.16	0.18	0.03	0.15	0.44	0.51	0.24ab
Cinncerate	15 ^d	ABCD	0.24	0.24	0.01	0.09	0.08	0.12	0.39	0.15b
AzaDirect; Employ	24 ^e ; 2 ^f	ABCD; AD	0.16	0.10	0.00	0.10	0.10	0.20	0.43	0.16b
Cinncerate; AzaDirect	15 ^d ; 24 ^d	AC; BD	0.13	0.23	0.11	0.11	0.11	0.15	0.37	0.18b
AzaDirect	24 ^d	ABCD	0.39	0.34	0.06	0.11	0.07	0.16	0.37	0.18b
Untreated check	–	–	0.26	0.24	0.25	0.09	0.34	0.40	0.73	0.34a
Treatment/formulation(s)	Rate/acre	Application dates ^a	Avg. PP 4th and 5th instars/ brushed leaf							
			29 Apr	8 May	16 May	25 May	30 May	4 Jun	13 Jun	Seasonal mean ^b
CX-10282	32 ^c	ABCD	0.00	0.02	0.01	0.06	0.06	0.07ab	0.04	0.04b
Cinncerate	15 ^d	ABCD	0.00	0.01	0.01	0.00	0.08	0.05b	0.02	0.03b
AzaDirect; Employ	24 ^e ; 2 ^f	ABCD; AD	0.00	0.00	0.00	0.01	0.02	0.00b	0.00	0.01b
Cinncerate; AzaDirect	15 ^d ; 24 ^d	AC; BD	0.00	0.03	0.05	0.02	0.03	0.01b	0.01	0.02b
AzaDirect	24 ^d	ABCD	0.00	0.03	0.02	0.02	0.00	0.01b	0.00	0.01b
Untreated check	–	–	0.00	0.00	0.07	0.10	0.09	0.27a	0.03	0.09a
Treatment/formulation(s)	Rate/acre	Application dates ^a	Avg. PP adults/tap							
			29 Apr	8 May	16 May	25 May	30 May	4 Jun	13 Jun	Seasonal mean ^b
CX-10282	32 ^c	ABCD	1.1	0.2	1.0	2.1	9.1	9.2	3.6	4.2b
Cinncerate	15 ^d	ABCD	1.4	0.6	0.6	1.9	16.2	10.7	2.6	5.4b
AzaDirect; Employ	24 ^e ; 2 ^f	ABCD; AD	1.6	0.8	0.4	1.3	9.1	10.6	3.1	4.2b
Cinncerate; AzaDirect	15 ^d ; 24 ^d	AC; BD	1.4	0.3	1.1	3.0	9.9	8.2	1.8	4.0b
AzaDirect	24 ^d	ABCD	1.4	0.6	0.4	1.1	9.4	8.2	2.4	3.7b
Untreated check	–	–	1.2	0.4	1.0	5.3	18.9	22.2	2.8	8.4a

Means followed by same letters within the same column are not significantly different according to Tukey's HSD.

^aA, 7 May; B, 15 May; C, 23 May; D, 1 Jun.

^bPost-treatment only (excludes 29 Apr).

^cfl oz.

^dfl oz, mixed with 0.25% 440 Oil.

^efl oz, and mixed with 0.25% 440 Oil on dates B and C.

^foz, mixed with 0.25% Regulaid