

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

Washington State University Tree Fruit Research and Extension Center 1100 N Western Ave Wenatchee, WA 98801, Phone: 509-663-8181 (louis.nottingham@wsu.edu; robert.orpet@wsu.edu; mcclaren@wsu.edu; ebeers@wsu.edu) and *Corresponding author, e-mail: louis.nottingham@wsu.edu

Subject Editor: Jonathan Babcock

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

The objective of this study was to assess efficacy of pesticides against PP in pear. At the time of the experiment, some of the insecticides tested were labeled for use in pear (Minecto Pro and FujiMite 5SC), whereas others are either awaiting a label (Harvanta) or in experimental phase (PLZ-1009). The trial was conducted at Washington State University’s Sunrise orchard near Rock Island, WA. The block is a 2-acre mixed planting of ‘Bartlett’ and ‘d’Anjou’ pear trees planted in 2007. These trees were maintained to commercial standards by pruning, under-tree sprinkler irrigation and weed, disease, and nutrient sprays. Treatment applications for this study occurred on 2 May (petal fall) and 20 d later. There were five treatment types and an untreated check (Table 1) with two ‘Bartlett’ and two ‘d’Anjou’ replications each (four total replications) organized in an RCB design. All sprays were applied using an airblast sprayer (Pak-Blast, OVS McMinnville, OR) at 100 gpa and were mixed with 0.25% 440 IAP petroleum oil. Plots consisted of four consecutive trees in the same row. Insect sampling was conducted on the two center trees of plots. PP adults, eggs, and nymphs were counted weekly, beginning with a pretreatment sample on 1 May, through 8 Jun. Forty leaves were collected per plot and returned to the lab. Leaves were brushed with a leaf brushing machine, which dislodges insects onto a revolving glass plate coated with diluted soap. The composite sample was counted under a stereoscopic microscope. The total number of each insect group is divided by 40 to gain per leaf estimate for analysis. Adult PP were sampled by beating tray and tap methods. The center two trees of each replicate received four ‘taps’ (two per tree). One tap refers to a subsample that entails three consecutive strikes with a hard rubber hose on a horizontal branch, dislodging insects onto a 45- × 45-cm white cloth tray. The number of PP adults falling on the tray is recorded for each tap, and the average of four taps per replicate is used for analyses. Data were analyzed in SAS

9.4. Response variables were PP eggs, early instars (first–third), and late instars (fourth and fifth) per leaf from leaf brushing, and adults per tap from beat trays. Mean response variables were compared within each sample date using generalized linear mixed models (PROC = GLIMMIX) assuming lognormal distribution for eggs and nymphs, and Poisson distribution for adults. Block was set as the random variable. Season-long differences in response variables were analyzed using repeated measures model incorporating data from all sampling dates except the pretreatment count. When there were significant treatment effects, we performed means separation using Tukey’s HSD multiple comparisons tests. Significance effects were accepted at $P < 0.05$ for all tests.

Overall, all of the pesticides tested in this study except Harvanta (cyclaniliprole) showed potential to suppress PP (Table 1). Before the first application, all PP life stages were present, with similar counts among all treatments and the untreated check. After this, PP adult densities increased in all treatments and the check, with a peak occurring on 24 May followed by a peak in egg on 31 May. For PP adults, all treatments except Harvanta had significantly fewer season-long counts than the check. Significant adult reductions compared with the check occurred on 15 May and 24 May for all treatments except Harvanta. None of the spray treatments significantly reduced PP eggs or early instar on individual dates or for the season-long average. Minecto Pro was the only treatment that reduced later instars compared with the check, which occurred on the final sample date, 8 Jun, and the season-long average.

This research was supported in part by the Washington Tree Fruit Research Commission and by industry gifts of pesticides and research funding.

Table 1.

Treatment/formulation	Rate/acre	Application dates ^a	Avg. PP eggs/brushed leaf						
			1 May	9 May	15 May	24 May	31 May	8 Jun	Seasonal mean ^b
Minecto Pro	12 fl oz	AB	0.17	0.05	0.03	0.13	0.44	0.28	0.18
Harvanta 50SL	16.4 fl oz	AB	0.10	0.00	0.03	0.23	0.44	0.14	0.16
FujiMite 5SC	32 fl oz	AB	0.00	0.03	0.00	0.13	0.41	0.23	0.13
PLZ-1009	8 fl oz	AB	0.04	0.00	0.02	0.19	0.29	0.09	0.10
Untreated check	–	–	0.07	0.03	0.03	0.12	0.60	0.17	0.17
Avg. PP first–third instars/brushed leaf									
Treatment/formulation	Rate/acre	Application dates ^a	1 May	9 May	15 May	24 May	31 May	8 Jun	Seasonal mean ^b
Minecto Pro	12 fl oz	AB	1.04	0.09	0.02	0.17	0.16	0.04	0.25
Harvanta 50SL	16.4 fl oz	AB	0.79	0.38	0.00	0.30	0.04	0.07	0.26
FujiMite 5SC	32 fl oz	AB	0.79	0.20	0.07	0.27	0.08	0.05	0.24
PLZ-1009	8 fl oz	AB	0.52	0.39	0.13	0.11	0.02	0.04	0.20
Untreated check	–	–	0.51	0.39	0.10	0.25	0.07	0.18	0.25
Avg. PP fourth and fifth instars/brushed leaf									
Treatment/formulation	Rate/acre	Application dates ^a	1 May	9 May	15 May	24 May	31 May	8 Jun	Seasonal mean ^b
Minecto Pro	12 fl oz	AB	0.08	0.04	0.00	0.01	0.03	0.00 b	0.03b
Harvanta 50SL	16.4 fl oz	AB	0.01	0.16	0.02	0.08	0.01	0.03ab	0.05ab
FujiMite 5SC	32 fl oz	AB	0.04	0.09	0.02	0.06	0.04	0.03ab	0.05ab
PLZ-1009	8 fl oz	AB	0.02	0.10	0.02	0.05	0.03	0.03ab	0.04ab
Untreated check	–	–	0.02	0.09	0.02	0.11	0.06	0.07a	0.06a
Avg. PP adults/tap									
Treatment/formulation	Rate/acre	Application dates ^a	1 May	9 May	15 May	24 May	31 May	8 Jun	Seasonal mean ^b
Minecto Pro	12 fl oz	AB	1.0	2.6	16.4b	15.6c	13.6	7.3	11.1bc
Harvanta 50SL	16.4 fl oz	AB	0.81	2.4	18.1ab	26.9ab	19.5	12.5	15.9ab
FujiMite 5SC	32 fl oz	AB	1.1	1.4	10.9bc	20.7bc	14.6	10.6	11.7bc
PLZ-1009	8 fl oz	AB	0.44	1.8	7.5c	16.1c	16.2	7.7	9.9c
Untreated check	–	–	0.63	3.3	28.8a	38.4a	19.1	7.9	19.5a

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

^aA = 2 May; B = 22 May.

^bPosttreatment only (excludes 1 May).