

(D2)

LEMON: *Citrus volkameriana* Pasquale ‘Volkamer’**SOIL APPLIED INSECTICIDAL CONTROL OF ASIAN CITRUS PSYLLID AND CITRUS LEAFMINER, 2008****Philip A. Stansly**

University of Florida/ IFAS
 Southwest Florida Res. and Ed. Center
 2686 State Road 29 North
 Immokalee, FL 34142-9515
 Phone: (239) 658-3400
 Fax: (239) 658-3469
 E-mail: pstansly@ufl.edu

Barry Kostyk

Asian citrus psyllid (ACP): *Diaphorina citri* Kuwayama
 Citrus leafminer (CLM): *Phyllocnistis citrella* Stainton

ACP adults and nymphs feed on and damage new growth and can acquire and transmit the bacterium *Candidatus Liberibacter asiaticus* responsible for the citrus greening or huanglongbing disease. CLM damages young leaves and exposes citrus leaf cuticle to the bacterium *Xanthomonas citri* which is responsible for the citrus canker disease. Therefore, both insects are serious pest in the Florida citrus and need to be controlled to reduce spread of these diseases. The trial was conducted at the University of Florida Southwest Research and Education Center in Immokalee, Florida, on 3-yr-old ‘Volkamer’ lemon trees planted at 15 × 22 ft spacing in double-row beds separated by a swale and running north-south. Four adjoining rows were used for a CRB design with 4 treatments replicated 4 times. Each plot consisted of 5 trees that were trimmed approximately every two weeks throughout the trial to encourage new growth (flushes) and provide suitable habitat for ACP nymphs. Weeds, debris and leaf litter were removed from beneath each tree prior to application. Insecticides were applied on 16 May 2008 in 8 oz of solution to bare soil within 18 inches of the trunk of the tree using an EZ-Dose® sprayer with a pressure of 45 psi and a flow rate of 3.7 gpm. Weekly evaluations were made by examining 5 flushes on each of five trees for the presence of ACP eggs and nymphs. For observations occurring after 27 Jun, the oldest stage of the ACP nymph (instar) was recorded along with an estimation of the population density based on the following scale: 0 = no infestation; 1 = less than 5 nymphs; 2 = between 6 and 10 nymphs; 3 = between 11 and 20 nymphs; and 4 = more than 21 nymphs. Adult ACP were monitored on each of five trees per plot by a “tap sample” obtained by gently striking the foliage three times with the hand and counting the adults that fell onto an 8 × 11 inch white surface held underneath. CLM larvae were counted on 5 leaves on each new shoot. Data were subjected to ANOVA with mean separation by LSD ($P = 0.05$).

Adult populations were initially low and no statistical differences were seen until 48 DAT when numbers were significantly reduced by Admire Pro and Platinum compared to the untreated check (Table 1). All treatments differed from the check at 55 DAT with significantly fewer on trees treated with Admire Pro compared to Venom which again was not different from the check at 63 DAT. All treatments reduced the percentage of infested flush at 14 DAT and 21 DAT with no effects seen from 28 to 42 DAT (Table 2). All treatments reduced flush infested with nymphs from 55 DAT through 84 DAT except Venom which only produced a significant response at 55 DAT. Differences between Admire Pro and Platinum were not significant on any date. The ACP density rating (Table 3) gave similar results. The oldest nymphal instar rating (Table 4) did not differ between Venom and the control except at 55, 77, and 84 DAT whereas differences were also significant with Admire and Platinum at 21 and 35 DAT and Platinum at 48 DAT. All treatments suppressed CLM at 14 and 21 DAT after which Venom failed to provide control (Table 5). Numbers of CLM were significantly lower on trees treated with Admire Pro compared to Platinum at 21 and 48 DAT. All treatments lost effectiveness at 77 DAT. Drenches of Admire and Platinum provided equal levels of ACP control for 3 months whereas control with Venom was more variable and short lived, possibly because of the greater solubility of this product. CLM control did not last as long as ACP control and appeared to be somewhat better with Admire Pro compared to Platinum.

Table 1

Treatment/ formulation	Rate product/acre	No. ACP adults per tap sample									
		30-May 14 DAT	6-Jun 21 DAT	13-Jun 28 DAT	20-Jun 35 DAT	27-Jun 42 DAT	3-Jul 48 DAT	10-Jul 55 DAT	18-Jul 63 DAT	1-Aug 77 DAT	8-Aug 84 DAT
Untreated check	---	0.30a	0.40a	0.25a	0.85a	0.25a	2.00a	2.55a	2.65a	0.70a	1.15ab
Admire Pro	4.67 fl oz	0.05a	0.05a	0.11a	0.20a	0.10a	0.25b	0.20c	0.70bc	0.50a	0.45bc
Venom 70 SG	3.83 oz	0.05a	0.10a	0.40a	0.50a	0.35a	1.15ab	1.15b	1.65ab	0.65a	1.30a
Platinum 75 SG	3.65 oz	0.05a	0.25a	0.10a	0.20a	0.10a	0.20b	0.40bc	0.40c	0.70a	0.25c

Means in each column followed by the same letter are not significantly different (LSD, $P = 0.05$).

Table 2

Treatment/ formulation	Rate product/acre	Percentage of flush with nymphal infestation									
		30-May 14 DAT	6-Jun 21 DAT	13-Jun 28 DAT	20-Jun 35 DAT	27-Jun 42 DAT	3-Jul 48 DAT	10-Jul 55 DAT	18-Jul 63 DAT	1-Aug 77 DAT	8-Aug 84 DAT
Untreated check	---	57.34a	30.67a	27.00a	30.00a	52.63a	58.00a	61.50a	56.00a	62.00a	91.33a
Admire Pro	4.67 fl oz	8.00bc	2.81b	11.11a	26.00a	45.00a	29.00b	18.50b	19.65b	26.00b	64.00bc
Venom 70 SG	3.83 oz	17.00b	11.58b	19.50a	40.00a	55.00a	63.00a	33.00b	51.37a	63.16a	80.25ab
Platinum 75 SG	3.65 oz	0.00c	9.67b	13.50a	24.00a	37.00a	37.50b	19.00b	16.00b	39.00b	58.00c

Means in each column followed by the same letter are not significantly different (LSD, $P = 0.05$).

Table 3

Treatment/ formulation	Rate product/acre	Mean ACP density rating					
		27-Jun 42 DAT	3-Jul 49 DAT	10-Jul 55 DAT	18-Jul 63 DAT	1-Aug 77 DAT	8-Aug 84 DAT
Untreated check	---	1.62a	1.59a	1.45a	1.14a	1.30a	2.34a
Admire Pro	4.67 fl oz	0.72b	0.36b	0.23c	0.31b	0.50b	1.53c
Venom 70 SG	3.83 oz	1.35a	1.35a	0.72b	0.99a	1.29a	1.95b
Platinum 75 SG	3.65 oz	0.57b	0.54b	0.30c	0.23b	0.78b	1.45c

Means in each column followed by the same letter are not significantly different (LSD, $P = 0.05$).

Table 4

Treatment/ formulation	Rate product/acre	Mean oldest nymphal instar rating									
		30-May 14 DAT	6-Jun 21 DAT	13-Jun 28 DAT	20-Jun 35 DAT	27-Jun 42 DAT	3-Jul 48 DAT	10-Jul 55 DAT	18-Jul 63 DAT	1-Aug 77 DAT	8-Aug 84 DAT
Untreated check	---	2.92a	2.67a	2.64a	2.94a	2.94a	3.27a	3.41a	2.66a	3.01a	3.92a
Admire Pro	4.67 fl oz	3.00a	1.00b	1.90a	2.11b	2.44a	2.93a	2.24b	2.56a	1.92c	2.70b
Venom (70%)	3.83 oz	2.36a	2.00ab	2.54a	3.16a	2.87a	3.07a	2.61b	3.03a	2.49b	3.09b
Platinum 75 SG	3.65 oz	no nymphs	1.40b	1.54a	2.00b	2.32a	2.37b	2.26b	2.13a	2.33bc	3.05b

Means in each column followed by the same letter are not significantly different (LSD, $P = 0.05$).

Table 5

Treatment/ formulation	Rate product/acre	CLM per 5 leaves					
		30-May 14 DAT	6-Jun 21 DAT	3-Jul 48 DAT	10-Jul 55 DAT	18-Jul 63 DAT	1-Aug 77 DAT
Untreated check	---	5.19a	3.03a	2.14a	1.32a	0.81a	2.91a
Admire Pro	4.67 fl oz	0.15c	0.10c	0.87c	0.79b	0.39b	2.43a
Venom (70%)	3.83 oz	2.62b	1.10b	2.09ab	1.30a	0.70a	2.27a
Platinum 75 SG	3.65 oz	0.02c	0.72b	1.54b	1.07ab	0.25b	2.67a

Means in each column followed by the same letter are not significantly different (LSD, $P = 0.05$).