

(D9)

ORANGE: *Citrus sinensis* (L.) Osbeck, 'Hamlin'

EVALUATION OF THREE APPLICATION RATES OF FENPYROXIMATE AND TOLFENPYRAD AGAINST ASIAN CITRUS PSYLLID AND CITRUS LEAFMINER IN ORANGES: FALL, 2012

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Asian citrus psyllid (ACP): *Diaphorina citri* Kuwayama

Citrus leafminer (CLM): *Phyllocnistis citrella* Stainton

ACP and CLM are key pests of Florida citrus due to their roles in the spread of two devastating citrus diseases. Asian citrus psyllid is a vector of citrus greening disease or "Huanglongbing" caused by the bacterium *Candidatus Liberibacter asiaticus*. Damage from CLM larvae facilitates spread of citrus canker caused by *Xanthomonas axonopodis* pv. *citri*. Therefore, effective control of both pests is critical to reduce spread of both diseases. The experimental block in a commercial grove near LaBelle, Florida contained 5-yr-old sweet orange 'Hamlin' trees planted at a density of 132 trees/acre. Trees were provided with drip irrigation and subjected to conventional cultural practices. Trees were pruned and sprayed with a 25-0-0 NPK liquid fertilizer at 1 gallon per 100 gpa to induce new growth for ACP and CLM infestation. Six treatments and an untreated check were randomly distributed in an RCBD over 5-tree plots in 4 rows, each replicate being separated by a buffer row. Treatments were applied 4 Oct 2012 using a Durand Wayland AF100-32 air blast speed sprayer with the fan disengaged, and operating at 1.9 mph and 400 psi using three John Bean ceramic nozzles on a single side delivering 40, 40 and 20 gpa bottom to top. Eight randomly selected shoots per plot were collected and examined under a stereomicroscope in the laboratory to count live ACP nymphs at 4, 11, 18 and 25 days after treatment (DAT). Three fully expanded leaves on each shoot were examined to count CLM larvae at 4 and 11 DAT. Density of ACP adults, ants, spiders, ladybeetles and lacewings was assessed at 4, 11, 18, 25, 32, 40, 47, 54, 61 and 68 DAT using a stem tap sampling method. A randomly chosen branch was struck 3 times with a short length of PVC pipe and individuals falling on a white clipboard placed underneath randomly selected branches were counted. Data were subjected to ANOVA and means separated using LSD (P = 0.05).

All treatments reduced nymphs compared to the untreated check through 18 DAT except for the low rate of Portal (Table 1). There were no significant differences between the 32 and 64 oz/ac rates of Portal, among the 3 rates of Apta or between Apta and the high rate of Portal. A significant reduction in adults compared to the untreated check was observed with Portal 5 EC at 64 oz/ac through 47 DAT and all rates of APTA through 65 DAT except the 11 oz/ac rate at 61 DAT. A significant reduction in CLM larvae was observed at 4 DAT with all treatments except Portal at 64 oz/ac and Apta at 14 oz/ac (Table 1).

Ant populations averaged over all sample days were significantly lower in the Portal at 32 oz/ac and Apta at 17 oz/ac treatments compared to the untreated check (Table 3). Significantly fewer spiders were seen on plants treated with Portal at 64 or 32 oz/ac and Apta at 17 or 11 oz/ac compared to untreated check. Ladybeetle numbers were significantly lower in all treatments whereas no effect was seen on lacewings. No phytotoxicity was observed.

Table 1

Treatment/ formulation	Rate amt product/100 gpa or % v/v	Mean no. ACP nymphs/shoot				Mean no. CLM larvae/ 3 leaves/shoot
		4 DAT	11 DAT	18 DAT	25 DAT	4 DAT
Untreated check	none	24.04a	24.29a	5.66a	6.54a	1.11a
Portal 5 EC + 435 Oil	64 oz + 1%	2.54cd	3.15cd	2.50b	5.61a	0.19a
Portal 5 EC + 435 Oil	32 oz + 1%	5.69bc	6.19c	2.41b	3.63a	0.42bc
Portal 5 EC + 435 Oil	24 oz + 1%	7.81b	11.50b	6.16a	6.11a	0.54bc
Apta 15 EC + 435 Oil	17 oz + 1%	0.85d	0.50d	0.03b	0.16a	0.58bc
Apta 15 EC + 435 Oil	14 oz + 1%	0.81d	0.66d	0.25b	1.41a	0.69ab
Apta 15 EC + 435 Oil	11 oz + 1%	2.58cd	4.97cd	1.09b	3.28a	0.42bc

Means in a column followed by the same letter are not significantly different (P > 0.05, LSD)

Table 2

Treatment/ formulation	Rate amt product/100 gpa or % v/v	Mean no. ACP adults/tap sample									
		4 DAT	11 DAT	18 DAT	25 DAT	32 DAT	40 DAT	47 DAT	54 DAT	61 DAT	68 DAT
Untreated check	none	0.67a	1.11a	0.94a	0.86ab	1.42a	0.94a	1.14a	0.56ab	0.58ab	0.89a
Portal 5 EC + 435 Oil	64 oz + 1%	0.00b	0.11bc	0.33b	0.42bcd	0.58ab	0.63ab	0.36bc	0.42bc	0.19bc	0.92a
Portal 5 EC + 435 Oil	32 oz + 1%	0.08b	0.39b	0.75a	0.81abc	0.97a	0.63ab	0.67ab	0.61ab	0.83a	0.67ab
Portal 5 EC + 435 Oil	24 oz + 1%	0.39a	0.25bc	0.88a	0.97a	1.44a	0.83a	0.83ab	0.89a	0.75a	0.55abc
Apta 15 EC + 435 Oil	17 oz + 1%	0.00b	0.00c	0.03b	0.11d	0.08c	0.17b	0.11c	0.17c	0.02c	0.08c
Apta 15 EC + 435 Oil	14 oz + 1%	0.28b	0.00c	0.11b	0.28cd	0.33c	0.22b	0.28bc	0.17c	0.11c	0.25bc
Apta 15 EC + 435 Oil	11 oz + 1%	0.08b	0.03c	0.08b	0.17d	0.11c	0.27b	0.25c	0.11c	0.22bc	0.22bc

Means in a column followed by the same letter are not significantly different (P > 0.05, LSD)

Table 3

Treatment/ formulation	Rate amt product/100 gpa or % v/v	Mean no. /tap sample			
		Ants	Spiders	Ladybeetles	Lacewings
Untreated check	none	1.54a	0.53a	0.09a	0.04a
Portal 5 EC + 435 Oil	64 oz + 1%	1.17ab	0.30bc	0.01b	0.03a
Portal 5 EC + 435 Oil	32 oz + 1%	0.58cd	0.34bc	0.02b	0.03a
Portal 5 EC + 435 Oil	24 oz + 1%	1.14abc	0.45a	0.01b	0.02a
Apta 15 EC + 435 Oil	17 oz + 1%	0.85bc	0.25c	0.00b	0.03a
Apta 15 EC + 435 Oil	14 oz + 1%	1.10abc	0.41abc	0.00b	0.07a
Apta 15 EC + 435 Oil	11 oz + 1%	1.12abc	0.25c	0.00b	0.04a

Means in a column followed by the same letter are not significantly different (P > 0.05, LSD)