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D16

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

EFFECT OF SPRAY VOLUME AND SPRAYER TYPE ON EFFICACY OF INSECTICIDES FOR CONTROL OF ASIAN CITRUS PSYLLID AND CITRUS LEAFMINER ON ORANGES: 2010

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

ACP and CLM are two economically important pests of Florida citrus due in large part to their role in the spread of greening disease or "huanglongbing" and citrus canker caused by *Xanthomonas axonopodis* pv. *Citri* respectively. We evaluated the efficacy of Movento in total spray volume 5, 10, 40 and 120 gpa compared to three other standard treatments. The two lower volume rates were applied with a Proptec rotary atomizer sprayer by varying speed of the peristaltic pump. The two higher volume rates were applied with a Durand Wayland 3P-10C-32 air blast speed sprayer operating at 2.3 mph and 200 psi with four Albuz ATR 80 nozzles per side delivering 40 gpa (white nozzles) and 120 gpa (green nozzles). The experimental block at the Southwest Florida Research and Education Center, Immokalee, Florida consisted of 15-yr-old sweet orange 'Valencia' trees planted on double-row raised beds at a density of 132 trees/acre. Trees were irrigated by micro-sprinklers and subjected to conventional cultural practices. Trees were pruned 3 wk prior to application to encourage growth of new shoots essential for reproduction of ACP and CLM. Eight treatment plots of 10 trees were randomly distributed across each of the 4 replicates, one per row separated by a buffer row. Treatments were applied on 30 Sep 2010 and evaluations made at 4, 11, 18 and 25 DAT. Fifteen randomly selected shoots per plot were collected and examined under a stereoscopic microscope in the laboratory to count ACP nymphs. Five of the 15 shoots were examined under the microscope to count CLM larvae and empty mines on three fully expanded leaves per shoot. Density of ACP adults was estimated from five trees in each plot by counting those falling on a white clipboard placed under randomly chosen branches which were then struck 3 times with the PVC pipe to make a count for one "tap" sample. Four tap samples were conducted per tree. Data were subjected to ANOVA and means separated using LSD ($P = 0.05$) are presented.

Most dead ACP nymphs at 4 DAT were observed in response to Agri-mek+Provado+ 435 Oil while Mustang Max and the two lowest volume treatments of Movento+435 Oil not different from the check (Table 1). Fewer live nymphs were seen for all treatments compared to the untreated check through 25 DAT except Mustang Max at the last observation. There were no significant differences in number of live nymphs among the different volume treatments of Movento + 435 Oil from 4 through 25 DAT. Agri-Mek+Provado+435 Oil was not different from any of the Movento treatments in regard to live nymphs on any date but performed better than either of the pyrethroids on all dates. All treatments provided significant reduction in ACP adults through 18 DAT but none did at 25 DAT. The only differences among sprayed treatments occurred at 18 DAT when all except Movento+ 435 Oil at 5 gpa or 40 gpa were significantly better than Mustang Max. Significantly fewer CLM larvae compared to the untreated check were observed on all trees at 4 and 11 DAT except those treated with Mustang Max and Baythroid (Table 2). Fewest larvae were seen at 18 DAT with Agri-Mek + Provado and 435 Oil but not different from Movento + 435 Oil applied at 40 gpa. At 25 DAT none of the treatments were significantly reduced larvae compared to the untreated check and some treatments now had more. Agri-Mek + Provado + 435 Oil resulted in fewest empty mines for 11 through 25 DAT although not different from Movento + 435 Oil at 120 gpa on 11 and 25 DAT nor the 5 and 10 gpa applications of these products at 25 DAT. Thus, Agri-mek + Provado + 435 Oil was clearly the best treatment for CLM although not better than Movento + Oil for ACP. While sprayer type did not produce clear differences with either pest, a trend toward better performance was seen with the greater of the two volumes applied by each sprayer.

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Table 1.

Treatment/ formulation	Rate amt product/ acre	Sprayer	Total application volume/acre (gallons)	Dead ACP nymphs/shoot/tree	Live ACP nymphs/shoot/tree				ACP Adults/tap sample/tree			
				4 DAT	4 DAT	11 DAT	18 DAT	25 DAT	4 DAT	11 DAT	18 DAT	25 DAT
Untreated check				0.20c	24.13a	16.90a	31.7a	19.57a	0.78a	0.69a	0.69a	0.14a
Mustang Max 1.5 EC	4 oz	Proptec	5	2.30bc	7.25b	5.33b	11.95b	23.86a	0.18b	0.15b	0.35b	0.14a
Baythroid XL 1 EC	3 oz	Proptec	5	4.20b	5.82bc	2.52bc	6.35bc	10.02b	0.13b	0.09b	0.06c	0.03a
Movento 240 SC + 435 Oil	10 oz + 3 gal	Proptec	5	2.33bc	1.18cd	3.07bc	4.50c	1.52c	0.30b	0.18b	0.15bc	0.20a
Movento 240 SC + 435 Oil	10 oz + 3 gal	Proptec	10	1.95bc	0.73d	0.20c	0.35c	0.44c	0.08b	0.06b	0.03c	0.00a
Movento 240 SC + 435 Oil	10 oz + 3 gal	Airblast	40	3.82b	1.65cd	2.48bc	6.85bc	1.54c	0.31b	0.23b	0.14bc	0.15a
Movento 240 SC + 435 Oil	10 oz + 3 gal	Airblast	120	3.08b	3.02bcd	1.31c	3.48c	3.23bc	0.28b	0.19b	0.06c	0.23a
Agri-Mek 0.15 EC + Provado 1.6 F + 435 Oil	10 oz + 10 oz + 3 gal	Airblast	120	8.25a	0.25d	0.20c	1.18c	6.32bc	0.01b	0.00b	0.00c	0.01a

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

Table 2.

Treatment/ formulation	Rate amt product/ acre	Sprayer	Total application volume/acre (gallons)	CLM larvae/3 leaf shoot/tree				CLM empty mines/3 leaf shoot/tree			
				4 DAT	11 DAT	18 DAT	25 DAT	4 DAT	11 DAT	18 DAT	25 DAT
Untreated check				5.70ab	6.20bc	5.60a	1.63c	1.05cd	3.25a	1.55c	4.32a
Mustang Max 1.5 EC	4 oz	Proptec	5	7.15a	10.75a	6.35a	2.90abc	1.70bc	1.50b	2.10bc	3.05bc
Baythroid XL 1 EC	3 oz	Proptec	5	4.05bc	7.35b	4.80ab	4.00ab	1.20cd	2.00b	2.25abc	3.20abc
Movento 240 SC + 435 Oil	10 oz + 3 gal	Proptec	5	1.75def	3.55d	4.85ab	1.55c	3.55a	1.40b	3.35a	2.70bcd
Movento 240 SC + 435 Oil	10 oz + 3 gal	Proptec	10	3.30cd	5.75bcd	5.65a	2.47bc	2.50b	1.75b	2.45abc	2.21cd
Movento 240 SC + 435 Oil	10 oz + 3 gal	Airblast	40	2.65cde	4.80cd	3.00bc	2.80abc	0.60d	1.30b	2.20abc	3.53ab
Movento 240 SC + 435 Oil	10 oz + 3 gal	Airblast	120	0.80ef	5.75bcd	4.40ab	2.35c	1.35cd	1.05bc	3.30ab	2.55bcd
Agri-Mek 0.15 EC + Provado 1.6 F + 435 Oil	10 oz + 10 oz + 3 gal	Airblast	120	0.07f	0.00e	1.30c	4.15a	1.00cd	0.10c	1.15d	1.85d

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