Chemical Control/New Products

CONTROL OF CODLING MOTH WITH NICOTINOID, PYRETHRIOD AMD REDUCED RISK INSECTICIDES IN PEARS

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Methods and Materials

The study was conducted on mature 'Bartlett' pear trees in a commercial orchard planted on a 25 ft x 25 ft spacing (70 tree/acre) near Fairfield, CA. Fifteen treatments were replicated four times in a RCB design. Each replicate consisted of an individual tree. Treatments were applied with a handheld orchard sprayer operating at 250 psi and delivering 200 gpa of finished spray (2.87 gal/tree). Application timings were based on degree-days (DD). DD were calculated with a 31 Mar biofix for the first generation and a 13 Jun biofix for the second generation using a single sine horizontal cutoff model with a lower threshold of 50˚F and an upper threshold of 88˚F. Maximum and minimum air temperatures were obtained from the IMPACT weather station near Cordelia, CA. Codling moth (CM) flight activity was monitored with a pheromone trap placed high in the tree canopy. The target application timings were: Avaunt with and without Omni Supreme oil (Tr. 1 & 2), Calypso and Assail at 200 and 600 DD from the 1st biofix and 200 DD from the 2nd biofix; Avaunt (Tr. 3), Baythroid, Danitol, and Omni Supreme oil at 250 and 650 DD from the 1st biofix and 250 DD from the 2nd biofix; the low rate of Calypso at 100 DD and at two weeks and four weeks after 100 DD from the 1st biofix and 100 DD after the 2nd biofix. The grower standard was Imidan at 250 DD from the 1st biofix and Guthion at 650 DD from the 1st biofix and 250 DD from the 2nd biofix. Actara and Agri-Mek combined with Omni Supreme oil were applied at 200 DD from the 1st biofix and then followed by the grower standard. Control of the first CM generation (overwintering flight) was evaluated on 7 Jun and control of the second generation (summer flight) was evaluated at commercial harvest on 31 Jul for CM infestation by inspecting a maximum of 250 fruit per replicate. Control of motile twospotted spider mites (TSM) and pear psylla (PP) nymphs was evaluated weekly from 8 May through 24 Jul by sampling 10 exterior and 10 interior leaves per replicate. The leaves were brushed and the motile TSM and PP nymphs were counted under magnification (20X).

Results and Discussion

This trial was conducted against a very high CM population with over 80% of the fruit infested at harvest in the untreated control. The grower standard, the grower standard plus Actara or Agri-Mek, and the high rate of Assail provided the best CM control. Avaunt, Calypso and Assail are promising new materials for CM, TSM and PP control. No phytotoxicity was observed with any experimental treatment.

Table 1. Mean percent CM infested fruit at first generation and commercial harvest and mean number of TSM and PP per 20 leaves in Fairfield, CA – 2000

Treatment/formulation	Rate lb (AI)/acre	No. app.	Percent infested fruit 1st Gen	Percent infested fruit Harvest	Total per 20 leaves TSM	Total per 20 leaves PP
Avaunt 30WG[a]	0.11	3	0.5abc	8.8abc	3.6a	14.5ab
Avaunt 30WG	0.11	3	0.7bc	13.8 c	3.6a	16.1ab
Avaunt 30WG	0.11	3	1.0c	14.2c	15.4abc	30.8cd
Calypso 4SC	0.096	4	0.0a	6.7abc	7.0a	11.4ab
Calypso 4SC	0.125	3	0.7bc	7.9abc	12.2ab	10.4ab
Assail 70WP	0.1	3	0.2ab	5.7ab	19.6abcd	5.7a
Assail 70WP	0.125	3	0.0a	3.7ab	28.4abcd	8.2a
Baythroid 2EC	0.022	3	0.3abc	14.1c	54.2cde	35.3d
Baythroid 2EC	0.022	3	0.8bc	13.5c	51.0bcde	35.5 d
Danitol 2.4EC	0.4	3	0.2ab	11.1bc	0.3 a	16.5 ab
Actara 25WG[b]	0.086	1	0.1ab	2.4a	59.0de	23.2bcd
Imidan 70 W[c]	4.2	1				
Guthion 50WP	1.5	2				
Agri-Mek 0.15EC[b]	0.012	1	0.0a	3.2a	1.4a	17.1ab
Imidan 70 W[c]	4.2	1				
Guthion 50WP	1.5	2				
Omni Supreme oil by vol.	1.0%	3	0.8bc	41.8d	3.6a	21.4bc
Imidan 70 W[c]	4.2	1	0.1ab	4.9ab	67.0e	63.8e
Guthion 50WP (grower standard)	1.5	2				
Untreated check			10.8d	80.5e	3.6a	17.8abc

Means followed by the same letter within a column are not significantly different (Fisher's protected LSD, $P \leq 0.05$). Data analyzed using an arcsine transformation.

[a]Includes 1.0 % Omni Supreme Oil by volume.

[b]Includes 0.25 % Omni Supreme Oil by volume.

[c]pH was adjusted to < 6.0 by Bu-pH-er.