Chemical Control/New Products

Codling Moth Pest Management with Spinosad

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Previous studies have shown potential for codling moth control with spinosad, the active ingredient in Success* Naturalyte* insect control. Studies were conducted to determine if spinosad could be integrated in a season-long codling moth program and determine factors for optimum performance.

Factors Affecting Efficacy

A trial was conducted in Orondo, WA, to examine rate, spray interval, and use of adjuvants. Success was applied at 4 or 8 fl oz/acre, at 7 or 14 day intervals, and with or without an oil adjuvant. Comparisons were made to Guthion and Confirm at biweekly intervals. An RCB design with four replicates was done. One hundred apples were evaluated for stings and entries at harvest. Total insect damage is shown in the figure below. Success showed efficacy comparable to Confirm with the high rate/7 day interval without oil and all treatments that contained oil adjuvant except the low rate/14 day interval. Success showed efficacy comparable to Guthion at the low rate/weekly/with oil and high rate/weekly/without oil. The high rate/weekly/with oil was statistically different, but numerically close. Oil had more significant effect at the 4 oz rate than it did at the 8 oz rate (Fig. 1).

Season-Long Programs

A season-long study was conducted in Fairfield, CA, on pears. Applications were made to single tree plots with RCB design using a handgun sprayer. Applications were timed based on the codling moth biofix targeted at first and second flight (lA, 1B, and 2A peaks). Evaluations were made by counting codling moth stings at harvest. European red mite and two-spotted spider mite populations were monitored weekly following the applications. Although Success alone provided significant fruit protection against codling moth in top fruit compared to the untreated, its best fit may be in a season-long program with conventional insecticides (Table 1). An advantage of Success programs was the significantly lower mite populations than the conventional OP program.

A similar season-long study was conducted in walnuts in Hollister, CA. Programs involving three applications of Success resulted in 1.2% nut damage caused by codling moth and navel orange worm compared to 0.4% damage in the trees treated with two applications of Lorsban-4E and one application of Imidan 70WP. These differences were not statistically significant. These results indicated that Success may be used alone or in combination with a soft OP such as Lorsban or Imidan for codling moth and navel orange worm management in walnuts.

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Summary

Success showed promise as an effective codling moth program, particularly in season-long programs. One fit would be in codling moth mating disruption programs where populations are low, while preserving valuable beneficials. Another fit would be in conventional programs with OPs or other synthetic insecticides, perhaps close to harvest to take advantage of short PHI, or in-season to minimize effects on beneficials and take advantage of short REI.

Table 1.

Treatment	Rate (lb ai/acre)	No. appl.	% CM infest. fruit	TSSM/20 lvs	ERM/20 lvs
Imidan 70WP Penncap-M Imidan 70WP	4.2 2.0 4.2	1 1 1	0.8 a	31.8 b	70.0 b
Imidan 70WP Penncap-M Success* 2SC	4.2 2.0 0.09	1 1 1	0.8 a	15.1 a	18.4 a
Imidan 70WP Penncap-M Confirm 2F	4.2 2.0 0.28	1 1 1	2.1 abcd	14.2 a	28.7 a
Imidan 70WP Success* 2SC	4.2 0.09	1 2	5.5 cd	4.3 a	2.6 a
Imidan 70WP Confirm 2F	4.2 0.28	1 2	6.0 d	3.7 a	3.9 a
Success* 2SC	0.09	3	3.8 bcd	0.5 a	0.8 a
Confirm 2F	0.28	3	5.8 d	1.4 a	2.4 a
Untreated	-	-	58.8 f	1.4 a	4.4 a