

<i>DESCRIPTION:</i>	Biologically Intensive Pest Management Program for Pears in Mendocino County
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Biologically Intensive Pest Management Program for Pears in Mendocino County

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Abstract

Two large field trials were conducted to evaluate the use of reduce-risk insecticides as supplemental codling moth control in orchards under mating disruption. The insecticides Avaunt and Intrepid were compared against an untreated control at one location and against the organophosphate insecticide Imidan (“standard program”) in the second location. These treatments were compared with and without the use of a post-bloom application of the miticide Agri-mek to evaluate the disruptive effects on both mites and psylla of the two programs (“standard” and “OP-free”). In both programs, the treatments that did not receive a post-bloom Agri-mek application had increased levels of spider mites and required a mid-season application of Apollo. In addition, spider mite populations were also higher in the “standard” program that received a post-bloom Agri-mek application. From these studies, a miticide appears to be needed when OP insecticides are used as supplemental CM control in pheromone mating disruption orchards and the total elimination of an in season miticide does not appear to be feasible even in an OP-free program in Mendocino county.

Introduction

Codling moth mating disruption is being implemented on the majority of the pear acres in Mendocino County. Mating disruption is not effective when codling moth populations are high. With the elimination of PennCap-M we lost the ability to bring populations down with one cover spray early in the spring. To bring populations down, the use of one or more cover sprays in addition to pheromone dispenser makes the program too costly at a time when the price of pears is at an all time low. New reduce-risk products have recently been introduced. It is imperative to evaluate different compounds for their efficacy against codling moth to avoid population increases in the future. Oblique-banded leafroller (OBLR) has been problematic in some years in Mendocino County. We evaluated the recent registered reduce-risk products for the control of OBLR.

The use of mating disruption has brought about the ability to reduce or eliminate miticides used for two-spotted spider mite, European red mite and certain insecticides used for pear psylla. CM mating disruption has enhanced beneficial insect and mite populations through the reduced number of OP pesticide application. We will compare the effects of reduced-risk insecticides to an organophosphate (OP) insecticide on the effects on two-spotted spider mites, predatory mites and pear psylla by evaluating this pesticides with and without the miticide Agri-Mek.

Objectives:

- To implement a low input pests management program

Plans and Procedures

We conducted two large replicated plots to test new reduced-risk pesticides as supplemental control for codling moth under mating disruption and to evaluate their effect on OBLR, spider mites and pear psylla. The reduce-risk programs were: 1) Avaunt with Agri-mek, 2) Intrepid with Agri-mek and 3) Intrepid without Agri-mek. These materials were compared against an O P insecticide or against an untreated control (in either case with and without Agri-mek) (see Table 1). The experiment was repeated at two different orchards: Grace and Vallette. At Grace the reduce-risk materials were compared to a control and at Vallette they were compared to the OP Imidan (Table 1). The Avaunt or Intrepid treatments were applied twice while Imidan was applied once. The rates used are presented in Table 2. Each treatment was 5 acres each, divided into 4 replicates for 1.25-acre plots. The treatments were placed in randomize block design. All orchards were under mating disruption (Consep's Checkmate CMWS dispensers applied twice at biofix and 90 days later at a rate of 160 dispensers/acre). Because two-spotted mite populations were high and reaching the action threshold of 2 mites per leaf, Apollo was applied on June 15 in the blocks that did not receive a post-bloom Agri-mek application (see Table 1).

Codling moth adult populations were monitored with traps using both 1-mg and 10-mg codlemone lures. Traps with 10-mg lures give an evaluating codling moth populations. Traps with 1 mg lures are used to determine if the rate of pheromone release from the dispensers used in the mating disruption is declining; the 1 mg traps should be shut down under effective mating disruption.

We inspected 1,000 fruits from each plot of each orchard three times during the growing season: 1) end of the first Codling moth generation, 2) before the first harvest, and 3) two weeks after harvest. At each sampling, we determined the percent damage caused by codling moth, OBLR, and boxelder bug.

Two-spotted spider mites, predatory mites, psylla nymphs and eggs were monitored approximately every two weeks from May through August by sampling 2 leaves from each of 20 trees per plot. We used a mite-brushing machine to evaluate the number of spider mites, predators and psylla eggs and nymphs.

Results

There was no significant difference in codling moth or oblique-banded leafroller damage between treatments at either of the two locations at the three sampling dates (end of 1st codling moth generation, harvest and post-harvest). Like wise, no damaging levels of pear psylla were observed at the two Mendocino pear orchards.

At the Grace orchard, two-spotted mite populations were significantly higher by June 6th in the two plots (control and Intrepid) that did not receive an Agri-mek application early in the spring (Table 3). Apollo was applied in those two plots on June 15 and populations declined and

remained low throughout the season. The Grace orchard did not receive an OP treatment. At the Vallette orchard, two-spotted spider mites populations were significantly high in those treatments (Intrepid and Imidan) that had not received a post-bloom application of Agri-mek (Table 4). Apollo was applied on June 15 and by June 27 spider mites populations had decreased in all treatments but the treatment with Imidan + Apollo had a significant higher population. By the end of the season the treatment of Imidan + Agri-mek had a significantly higher population.

Conclusion

By using mating disruption and reducing or eliminating OP sprays, pear growers in the Ukiah Valley have been able to eliminate the miticides applied post-harvest and reduce the rate and number of applications to one in-season miticides application early in the spring. In this study two-spotted spider mites population reach the action threshold when we tried to eliminate the spring miticide spray. Spider mite population increased even in the control that did not receive any supplemental sprays but did not have the spring miticide. A miticide appears to be needed when OP insecticides are used as supplemental CM control in pheromone mating disruption orchards

Table 1. Treatment dates in two pear orchards: Grace and Valette in Mendocino county.

1 st Application		2 nd Application		Summer application	
Treatments	Date			Treatment	Date
Grace Orchard					
Auvant + Agri-mek	13-Apr			Apollo	15-Jun
Intrepid	13-Apr				
Intrepid + Agri-mek	13-Apr				
Agri-mek	13-Apr				
Control				Apollo	15-Jun
Valette Orchard					
Auvant + Agri-mek	25-Apr	Auvant	14-May	Apollo	15-Jun
Intrepid	25-Apr	Intrepid	14-May		
Intrepid + Agri-mek	25-Apr	Intrepid	14-May		
		Imidan	14-May	Apollo	15-Jun
Agri-mek	25-Apr	Imidan	14-May		

Table 2. Treatment rates

Treatment	Rate
Auvant	6 oz/acre
Intrepid	16 oz/acre
Agri-mek	12 oz/acre
Imidan	5 lb/acre
Apollo	6.4 oz/ acre

Table 3. Average number of spider mites per leaf in 5 treatments at the Grace orchard.

Treatment	Average # of Spider Mites/leaf			
	May 11	June 6*	June 13	June 27
Avaunt + Agri-mek + oil	0.00	1.50 b	0.31 b	0.60
Intrepid + (Apollo on 6/15)	0.02	3.31 a	1.43 a	0.41
Intrepid + Agri-mek + oil	0.01	0.86 b	0.14 b	0.41
Agri-mek + oil	0.00	1.03 b	0.45 b	0.27
Control + (Apollo on 6/15)	0.05	1.78 ab	0.69 b	0.33

* Number followed by a different letter in the same column is significantly different (p=0.01)

Table 4. Average number of spider mites per leaf in 5 treatment at the Valette orchard.

Treatment	Average # of Spider Mites/leaf*				
	May 30	June 13	June 27	July 18	August 27
Avaunt + Agri-mek + oil	0.26 b	0.30 c	0.11 b	0.97 ab	0.22 b
Intrepid+(Apollo on 6/15)	0.88 a	0.36 b	0.25 b	0.32 c	0.07 b
Intrepid + Agri-mek + oil	0.19 b	0.04 c	0.21 b	0.51 c	0.08 b
Imidan + (Apollo on 6/15)	1.05 a	0.62 a	0.76 a	1.35 a	0.20 b
Imidan + Agri-mek + oil	0.14 b	0.09 c	0.24 b	0.86 ab	0.61 a

* Number followed by a different letter in the same column is significantly different (p=0.01)