Project Number: 98-HS-o1

MANAGEMENT OF ANTS IN ALMONDS

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ABSTRACT:

The major ant pest of almonds is the southern fire ant and most of the research has been aimed at this species. Management of ants is probably an important component in the development of effective means to decrease ant damage to almonds at harvest. One of the objectives of this research is to find an effective means of eliminating ants from the orchard at harvest. Previous research identified AMDRO as an effective ant bait poison in controlling the southern fire ant. This material, developed by American Cyanamid Corporation is currently registered for use in all states but California. Other products used in this research were CLINCH, a stomach poison developed by Novartis, which contains ABAMECTIN, and KNACK an insect growth regulator containing NYLAR developed by Valent Corp. All of these materials are baits applied to corn grit with soybean oil. Timing of application of baits to give the longest reduction of ant activity was the major goal of this research. Amdro applied July 15 gave the best results although no application completely eliminated the southern fire ant from the test plots. Knack applied on June 1 reduced colony feeding activity for a normal harvest year. Clinch was applied in accordance with the CALEPA research authorization but could possible have given better results if applied two weeks later.

OBJECTIVES:

1. Determine the best timing of application of four candidate ant-control baits on populations of southern fire ants in San Joaquin Valley almond orchards.
2. Work with manufacturers of the baits and with federal and state agencies to obtain registrations permitting their use on almonds.

PROCEDURES:

1. Determine the best timing of application of four candidate ant-control baits on populations of southern fire ants in San Joaquin Valley almond orchards. All of this work was done in 1-acre, replicated plots in young almond orchards that were not harvested in 1998. All plots had significantly high southern fire ant populations. Materials were applied at label rates. Treatments (except for Lorsban) were broadcast-applied, using a hand held fertilizer applicator, on the following dates:

Treatment	May 1	June 1	July1	July 15
1. Amdro once	X			
2. Amdro once		X		
3. Amdro once			X	
4. Amdro once				X
5. Amdro twice	X		X	
6. Amdro twice	X			X

7. Amdro twice	X	X	
8. Amdro twice	X		X
9, Knack	X		
10. Knack		X	
11.Lorsban June 11 and July 15			
12. Clinch	X		
13. Untreated			

Fall Treatment.	September	March
A. Knack	X	X
B. Amdro	X	X
C. Untreated		

We used large, acre sized plots to avoid ant reinfestation from surrounding areas, and to ensure testing was done under a variety of orchard conditions. Replicates were conducted in three separate orchards. Ant control in the various plots was evaluated at two-week intervals by the process of "hot-dogging". A slice of hot dog is placed in a flip-top plastic vial. Ten vials were placed in each plot starting at 7 a.m. and picked starting two hours later. The vials with ants in them were snapped shut and taken back to the lab. where the ants were identified and counted later.

2. Work with manufacturers of the baits and with federal and state agencies to obtain registrations permitting their use on almonds. We recognize that little benefit will result from this research unless the product is found effective in ant control and can meet the approval of federal and state regulatory agencies. These materials were purposefully selected because they are already registered for use in other commodities giving them a reasonable chance of obtaining registration on almonds. Contact has been made with representatives of USEPA and CALEPA , as well as with the manufactures for the various materials. American Cyanamid and Novartis should have a label for use of their products on almonds for the 1999 season.

RESULTS AND CONCLUSION

Field experiments have demonstrated the usefulness of Amdro, Clinch or Knack as a bait insecticide against the southern fire ant. The dates of application were established as if this were to be an average year but harvest was as much as three weeks late this year. Although the numbers are variable a single application of amdro applied 14 days prior to harvest, according to the manufactures label gives better results than two applications. Both knack and clinch give good control with the timing of application being the key. Our best results again this year were obtained when the baits were applied 24 to 72 hours after a microjet or sprinkler irrigation was completed. At this time the ant colony is moved close to the surface where colony living conditions, temperature and moisture are at the optimum and foraging activity is the greatest

Knack is an insect growth regulator (IGR) and takes time to reduce colony size by slowing the rate of development of immature ants. As the older ants die off there are

fewer replacements to forage for food and tend the queen and brood. The reduced number of foraging adults in-turn reduces crop damage. Since southern fire ant colonies are multi-queen and produce reproductive generations twice a year total elimination of the colony is difficult.

Clinch is a stomach poison that is passed from the workers to the queen and kills all ants it contacts. If it is not passed to the brood and queen the colony will rebound quickly. Timing again is the key to this application. Remove as many workers and starve the brood before they can regenerate in large enough numbers to do crop damage.

Amdro is an excellent stomach poison that can be passed from the workers to the queen. It needs to be made available to the greatest number of workers during periods of rampant foraging. As workers forage and move food into their cache the major portion of the workers are eliminated. Since amdro takes several hours to work a great amount of damage can be inflicted on the colony in a day or two.

Table 1. Mean number of southern fire ants per treatment in almonds.

TREATMENT	DATE							
	June 9	Jun16	Jun 29	Jul 9	Jul 21	Aug10	Aug 25	Sept. 11
1.	0	51.7	119	0	0	0	656.7	110
2.	2.7	0	0	0	0	268	691.3	34.7
3.				0	0	21.7	285.3	47.3
4.					0	125	61.3	11.3
5.	0	0	0	0	0	0	249.7	61.3
6.	1.7	0	0	0	0	0	47.3	83
7.	0	0	0	0	0	2.7	66	54.3
8.	0	0	0	0	0	0	7.3	66.3
9.	402	363.3	383.3	0.3	0	1.3	22.3	41.3
10.				254	663.3	430	129.7	14.3
11.		0	0	90	68.3	798.3	465.7	43
12.	0.3	13.3	23	0	0	0	71.7	489.7
13.	20	28.3	63.7	40.3	475.3	560.3	532.3	250.3

Table 2. Mean Number of Southern Fire Ants Per Treatment With September 24 Application and March 2 Reapplication.

TREATMENT	DATE				
	Nov 12	Mar 2	Apr 13	Jun 9	July 14
Knack	289	82	0	65	915
Amdro	330	138	0	530	805
Untreated	730	374	195	340	1085