



Almond PMA Newsletter

Fall 2000

If you have questions about:

PMA Field Days?

Reduced-Risk Practices?

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**Or Check the Website:
www.almondboard.com/environmental**

This newsletter is published with funds provided by the California Department of Pesticide Regulation. The Almond Pest Management Alliance (PMA) project is designed to promote a reduced-risk system of almond production through the use of alternative products, actual on-site demonstrations, and grower education. The PMA partners include: the Almond Board of California, the Almond Hullers and Processors Association, the UC Statewide IPM Project, UC Cooperative Extension farm advisors, and the Community Alliance with Family Farmers.

Stanislaus County Update

After two years of intensive monitoring, we have not seen an increase in any pest in the “soft” treatments compared to the standard growers’ practices. There also have not been any differences in rejects due to Peach Twig Borer (PTB) or Navel Orangeworm (NOW) at harvest. It is clear San Jose scale (SJS) parasites are significantly reduced in areas where a pyrethroid is applied in the dormant period and an organophosphate (OP) is applied in-season. In Stanislaus County, almond and stonefruit orchards rarely have significant damage from SJS whether orchards are treated with insecticides or not. However, in areas where SJS is a serious threat, growers should understand that the use of some insecticides could exacerbate their scale problems.

The cost of the Bacillus thuringiensis (Bt) program is almost identical to the grower’s standard pesticide program. This includes the cost of two May sprays of Bt. No additional application costs are incurred during the bloom sprays if Bt can be applied with regularly scheduled fungicide or nutrient sprays. If Bt timing does not correspond well with other sprays or a third application is necessary, cost of the Bt program could be slightly higher than the standard program. However if pyrethroid or OP sprays create the need for a mite spray, a Bt program could prove more cost effective. The intermediate treatment is twice as expensive as the other two programs. The costs of Success and Agrimek far exceed their alternatives. In addition, Agrimek must be applied early in the season as a preventative treatment, often leading to unnecessary, expensive applications.

One should use caution when interpreting results from this trial. We are only half-way through a four year study. In addition, this orchard appears to be in an area with fairly low pest pressure. It is possible damage would remain low in this orchard even if it remained completely untreated. A Bt program may prove less satisfactory in an orchard under high PTB pressure.

Costs of Three Pest Management Programs (through June 12) Stanislaus County Almond PMA Trial, 2000		
TREATMENT	APPLICATION	COST/ACRE
Grower’s Practice (RED)	Dormant Spray	\$57.66
	May Spray	\$41.00
	Mite Spray	\$8.32
TOTAL COST		<u>\$106.98</u>
“Reduced Risk” Pesticides (WHITE)	Dormant Spray	\$84.09
	May Spray	\$48.83
	Mite Spray	\$83.33
TOTAL COST		<u>\$216.25</u>
“Soft” Program (BLUE)	Dormant Spray	\$30.12
	Bloom-time PTB Sprays	\$20.94
	May PTB Sprays	\$50.90
	Spot Mite Sprays	\$7.11
TOTAL COST		<u>\$109.07</u>

Kern County Update

Pest monitoring in the PMA blocks continued throughout the season. The pest species monitored were PTB, NOW and SJS.

Leaf monitoring for mites on Nonpareil and Butte varieties began in mid-April. Due to the absence of predators, the orchard was treated for mites on 5/26. Every other middle of the conventional blocks was sprayed with Omite®. The treatment rate was four pints of Omite® in 200 gallons of water per acre. Western predatory mites were released in the reduced input blocks on 5/25. Two different methods of release were used. The first was hand placing one bean plant, containing predatory mites, in each tree. The second method involved releasing the mites with a device developed by Ag/Attack of Visalia. Warren Sargent, from Ag/Attack, made the releases using a mite machine mounted on the back of an ATV traveling under four miles per hour. In both cases the rate of release was 2,500 mites per acre.

Ant treatments were applied prior to harvest. The reduced input blocks were treated with Clinch® at a rate of one pound per acre six weeks before harvest. The conventional blocks were treated with Lorsban® at a rate of four pints in 100 gallons of water. In both cases, ant treatment was only applied to the soft shell varieties.

Harvest of Nonpareils took place on 8/8 and Buttes were harvested on 9/23.

Butte County Update

The key to reduced risk practices is intensive monitoring. This orchard was monitored weekly throughout the season. In addition, harvest samples were collected and inspected for damage.

There are four blocks in this orchard with the following treatments: grower standard, soft chemical, dormant OP spray and dormant OP spray plus an OP hullsplit spray.

PTB traps were placed in each block of the PMA orchard. PTB shoot strikes were also monitored and only two shoot strikes were noted in the entire orchard.

NOW traps were also placed, and there were very few eggs detected. These low populations are attributed to winter sanitation, the most effective means of controlling NOW. By early March, the number of mummy nuts in the entire orchard was less than one per tree.

New SJS traps were placed in the tree weekly as the old traps were collected, wrapped in plastic wrap, and brought back to the laboratory to be evaluated under a microscope. When male scale was detected on the traps, the parasite, *Prospatella*, was most often detected as well.

Leaves were collected and inspected for red and two-spot mites, and beneficial mites and insects. The total season count shows that the grower standard block had the least mites and the second highest number of beneficial insects observed. Counts of mites and their predators increased in August just before harvest, too late for treatment. Next year these mites will not be detrimental to tree performance, since the population increase occurred late in the season and defoliation was minimal.

European fruit lecanium (EFL) populations have been building in this orchard. It was not detected in the first year of the project, yet signs of a population were detected during the dormant spur sample inspection. Populations have not been detected in the two treatments receiving a dormant spray. No monitoring protocol was developed however, a satellite project studying oil sprays for the control of EFL was conducted in Butte County and the results are pending.

Despite intensive monitoring, neither ant activity nor disease outbreaks were detected in the PMA orchard this year.

Harvest samples were collected from Nonpareil trees on 8/16, and the almonds were inspected for PTB, NOW, oriental fruit moth and ant damage. Quality was outstanding in all four blocks.

The PMA has just completed the second year of studying reduced risk techniques. In most instances, there was an increase in the total seasonal pest numbers but not in the harvest damage.

Trends in dormant applications in almond orchards

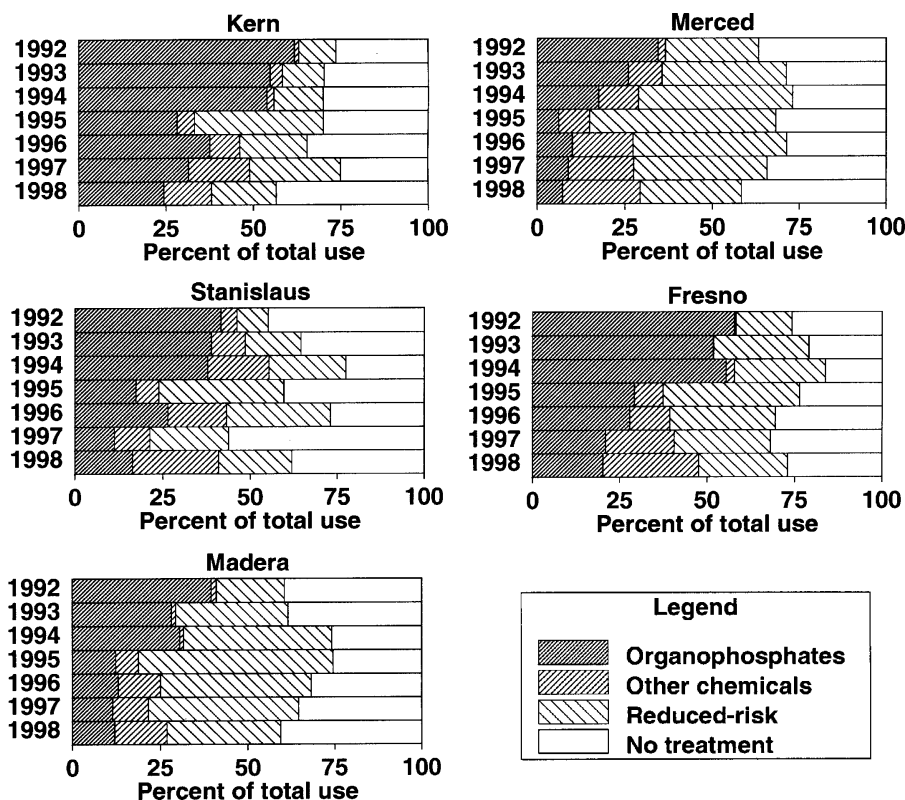
By Lynn Epstein, Susan Bassein, and Frank Zalom

Dormant applications of OPs in almond orchards are one source of surface water contamination. The state of California is mandated by the US Clean Water Act to reduce movement of OPs into surface water. One strategy to reduce movement of OPs into surface water is to use pest management alternatives. Here, we used the individual applicator records from the California

For more information on any of the three PMA demonstration orchards check the PMA website at: Almondboard.com. In the Environmental section, click on "Pest Management Alliance," then click on "Status Reports."

Or call the UCCE Farm Advisers

Joe Connell , Butte Co.	(530) 538-7201
Mario Veros, Kern Co.	(661) 868-6211
Roger Duncan, Stanislaus Co.	(209) 525-6800



Bar graphs of the relative amount of area planted in almond orchards that were treated during the dormant season or at bloom between 1992 and 1998. Each year extends from Dec. 10 of the previous year to Mar. 20 of the indicated year. Treatment categories were as follows: 1) organophosphates; 2) other chemicals, i.e., pyrethroids, carbamates, or endosulfan; 3) "reduced-risk" products: *Bacillus thuringiensis*, spinosad, or horticultural mineral oil without another insecticide or 4) "no treatment."

Pesticide Use Reports from 1992 to 1998 in order to document a decline in use of dormant-season OPs, and an increase in use of their alternatives in almond orchards in California.

A Brief Review of Pest Management Alternatives

The first recommended alternative to dormant season OPs is to monitor for the pests, treating only when the pest is present. For PTB, alternative biologically-based treatments may include any of the following: bloomtime sprays of the biocontrol agent Bt; a dormant, bloom or in-season application of spinosad (Success), or in-season use of pheromones for mating disruption. For SJS, the reduced-risk treatment is a high rate of oil without another insecticide.

To control the pests indicated above, growers also can use conventional pesticides that have a broad range of activity and are somewhat effective: either pyrethroids (e.g., Ambush, Asana or Pounce) or in some instances carbamates (e.g. Sevin). However, there are environmental risks associated with these materials. Dormant applications of pyrethroids and carbamates might potentially contribute to contamination of surface water. Furthermore, in areas of the Sacramento Valley, there is greatly increased tolerance of PTB to

pyrethroids, with some observed field failures. Also, residues of the pyrethroid insecticides permethrin and esfenvalerate persist on bark, and may impact beneficial arthropods for an extended time period.

OPs: reductions and current use

The bar graphs show the area treated with differing categories of dormant treatments. In almond orchards, the percentage of area treated with OPs declined between 1992 and 1998. The decline generally occurred in 1995. That is, use of dormant OPs was less in the 1995 to 1998 period than in the 1992 to 1994 period.

Despite the reductions in dormant season OPs, large quantities of OPs were still applied in dormant orchards. In the 1996 to 1998 period, a total of 107,195 kg (236,112 lbs) of OPs were applied yearly on the almond orchards in the eleven counties with a minimum of 25 km² (6,175 acres) of almond orchards (data not shown).

Replacement of OPs

In the bar graphs, "other chemicals" are primarily pyrethroids. In almond orchards, the decline in area treated with dormant applications of OPs was generally accompanied by an increase in area treated with pyrethroids. Some pyrethroids are less expensive than OPs and the other alternatives.

The bar graphs also illustrate that the area of almond orchards treated with reduced-risk alternatives increased in most counties. Use of either *B. thuringiensis* or oil without a conventional insecticide increased in almond orchards. Finally the bar graphs show that a substantial area was not treated with either OPs or with other conventional pesticides.

Additional information on monitoring for insects, and the use and cost of the alternatives is on the UC IPM web page (<http://www.ipm.ucdavis.edu/WATER/OPCALC/>). While the decline in use of dormant season OPs is a remarkable accomplishment for the almond industry, the partial replacement of OPs with pyrethroids may ultimately result in new pest management and environmental problems in the future. Greater use of reduced-risk alternatives to dormant season chemicals could further reduce use of OPs, as well as pyrethroids and carbamates, and thereby reduce the risk of environmental contamination and additional regulation.

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2000 Fall Almond PMA Newsletter

TWO UPCOMING PMA FIELD DAYS!

MADERA COUNTY

December 14, 2000
 8:00 A.M. – 12 noon
 121 N. "G" St.
**WINTER ALMOND
 PMA FIELD DAY**

Topics:
 • Ant control
 —Lonnie Hendricks

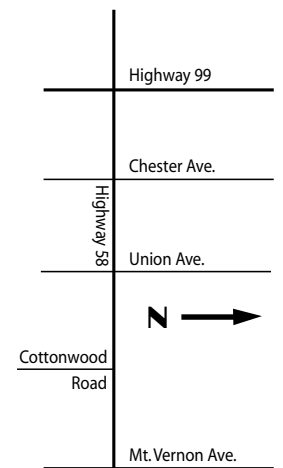
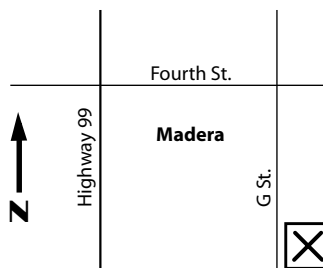
- PMA update Stanislaus Co.—Roger Duncan
- PMA update Kern Co.—Walt Bentley
- Spring Diseases: fungicide resistance mgmt.
 —Brent Holtz
- Spring Diseases—Beth Tevidale
- Almond leaf scorch—ID and pruning

*2.5 PCA credits
 requested*

KERN COUNTY

November 22, 2000
 8:00 A.M. – 12 noon
 1031 S. Mt. Vernon, Bakersfield
DORMANT SPRAY MEETING

Topics:
 • Best strategies for dormant spray.
 • Do you really need a dormant spray?
 • Does sanitation control Navel
 Orangeworm?
 • The value of zinc sprays for disease
 and insect control.
 • Orchard floor management during
 the dormant season.



Please join us for the latest information on almond pest control strategies