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POMOLOGY NOTES

ALMONDS

November / December, 2009

Upcoming Meetings:

December 1	Sutter Co. Ag Com. Grower Meeting	Yuba City
December 7	Blue Orchard Bee Meeting	Chico
December 9-10	Almond Board of Calif. Conference	Modesto

Almond Orchard Activities to Consider for November/December:

- ◆ **Orchard Sanitation:** Goal = two mummy nuts or less per tree. Use harvester or long poles to knock mummy nuts out of trees. Destroy the mummies by first windrowing them on the orchard floor and then mowing, discing or rototilling over the windrow. Navel orange worm (NOW) overwinters in mummy nuts (where dormant spray cannot reach). It is cheaper to kill them this way (winter sanitation) than to hope one or more sprays in season (May or hull split sprays) will kill them. At best, hull split sprays only control 50% of NOW. When sanitizing your orchard, don't skip the hard shell varieties. Dr. Joel Siegel, USDA researcher in the Fresno area, recently reported that NOW can overwinter in Butte and other hard shell varieties.
- ◆ **Check for scale:** Take a dormant spur sample. Don't let this potentially damaging pest sneak up on you. For details on taking a dormant spur sample, call me at 218-2359, talk with your PCA, or look on the internet at: <http://www.ipm.ucdavis.edu/PMG/r3900211.html>.
- ◆ **Peach twig borer control?** Consider your options for PTB control. They include a dormant spray, a bloom spray, a May spray and/or summer (hull split spray). NOW often attacks nuts that have first been hit by PTB. New pesticides are very effective for PTB control in early (dormant, delayed dormant, or bloom) sprays. See information in this newsletter.

- ◆ **Gophers.** Consider controlling gophers if active mounds in the orchard.
- ◆ **Strip sprays:** Check orchard for emerging winter weeds and remaining summer weeds. Pictures of seedling winter weeds common in almond orchards are found in this newsletter and on the web at: <http://www.ipm.ucdavis.edu/PMG/C003/m003ppwntrweeds.html>.
- ◆ **Apply potassium** -- where leaf samples indicate need -- to blocks irrigated by flood or solid set sprinklers. Micro-irrigated blocks can wait until spring to inject potassium with irrigation water. Band apply, only.
- ◆ **Plan for 2010 season.** Review grade sheets and leaf analyses. How did the year look and what could you change for next year? Plan your general orchard pest and nutrient management program for new season.



New pesticides are effective on Peach Twig borer in early sprays.

Peach twig borers (PTB) are a key pest of almonds. Nuts damaged by PTB are preferred feeding sites of navel orangeworm (NOW). At a recent almond IPM meeting in the San Joaquin Valley, a leading independent PCA told the audience that a good NOW program included PTB control. Talk with your PCA and review reject sheets and moth traps to decide if PTB control is needed in your orchard.

Dormant, delayed dormant, or bloom sprays, with the proper pesticide, give effective PTB control when applied properly (every-row spraying and proper sprayer speed). Other effective timings include a spring or summer spray(s) timed using moth trapping data and degree days.

Recently registered pesticides give excellent PTB control in research by Dr. Frank Zalom, UC Davis Entomology Department, in the Sutter/Yuba region (see table below). These materials are less toxic to operators and wild life, especially those that live in water. Consider these new materials as part of a PTB control program in your orchards. Organo-phosphate pesticides (Lorsban, diazinon, etc.) and pyrethroids (Asana, Warrior, Brigade, Baythroid, Mustang, etc.) are very effective on PTB, but can harm fish and other life in local streams if the pesticide moves to the water in drift or water runoff from rain or irrigation. Including a new pesticide in your PTB program in dormant to bloom also helps avoid pest resistance to organo-phosphates and/or pyrethroids.

Efficacy of new pesticides for peach twig borer control in dormant to bloom timings.

Materials applied to 2nd leaf almond trees in commercial orchards with a spray volume equivalent to 100 gpa. For more details, see Almond Board of California research reports for years listed. Research by Dr. Frank Zalom, UC Davis.

Year	Treatment	Rate (product/acre)	Spray Timing	Ave. # strikes/tree
2004	Untreated			4
2005	Untreated			16
2006	Untreated			9
2007	Untreated			13
2009	Untreated			12
2004	Dimilin	16 oz. + 1.5 gal. oil	Dormant	0
2004	Dimilin	12 oz. + 1.5 gal. oil	Delayed dormant	0
2004	Dimilin	12 oz + 1 qt. summer oil	20% bloom	1
2005	Dimilin	16 oz + 1.5 gal. oil	Dormant	0
2005	Dimilin	12 oz + 1 qt. summer oil	Delayed dormant	1
2005	Dimilin	12 oz+ 1 qt. summer oil	Pink bud	0
2006	Dimilin	12 oz + 4 gal. oil	Delayed Dormant	0
2004	Intrepid	10 oz	20% bloom	1
2004	Intrepid	10 oz	80% bloom	1
2005	Intrepid	10 oz + 1 pint B-1956	Pink bud	0
2005	Intrepid	12 oz + 1 pint B-1956	Delayed Dormant	0
2005	Intrepid	5 oz + 1 pint B-1956 (2x)	Pink bud & full bloom	0
2006	Intrepid	10 oz. + 4 gal. oil	Dormant	1
2006	Intrepid	10 oz. + 4 gal. oil	Delayed Dormant	1
2006	Intrepid	10 oz. + 1 pint Latron B-1956	Pink bud	1
2007	Intrepid	10 oz + 1 Latron B-1956	Bud swell	1
2006	Dipel + oil; Dipel	1 lb + 1 gal.oil; 1 lb.	First Bloom; Full Bloom	1
2006	Seize 35 WP + oil; Dipel	5 oz. + 1 gal. oil; 1 lb.	First Bloom; Full Bloom	2
2007	Altacor	4 oz	Dormant	0
2007	Altacor	3 oz + 4 gal. oil	Dormant	0
2007	Altacor	4 oz + 4 gal. oil	Dormant	0
2007	Delegate	1.6 oz + 4 gal oil	Dormant	0
2007	Delegate	2.4 oz + 4 gal. oil	Domant	0
2007	Delegate	3.2 oz + 4 gal. oil	Dormant	0
2009	Delegate	3 oz	Dormant	1
2009	Belt	4 oz	Dormant	0
2009	Lorsban EC	0.5 gallon	Dormant	1
2009	Asana	9.6 oz	Dormant	1
2009	Lorsban Advanced	0.5 gallon	Dormant	1

Brief review of comprehensive Almond Pest Management Class

I attended the comprehensive Almond Pest Management Course held in Fresno and Stockton November 4th and 5th. Here's some of what I learned:

- **Aflatoxin contamination of almond nuts threatens the economic health of the California almond industry.** Aflatoxins are a group of natural chemicals produced by certain molds. Chronic exposure to aflatoxins increases the risk of liver cancer. Navel orangeworm (NOW) feeding is a source of aflatoxin contamination of almond nuts. The European Union (EU) has one of the lowest tolerances for aflatoxin contamination in the world today. In 2007-08, Europe bought almost a third of all almonds grown in California. In 1997, the EU banned imports of Iranian pistachios due to high aflatoxin levels. They could do this to California almonds if the California almond industry doesn't focus on minimizing the risk of aflatoxin contamination. Using good IPM practices to control NOW helps reduce the risk of aflatoxin contamination in almond.
- **Winter sanitation is the cornerstone of an almond IPM program for NOW control.** Many different speakers made this point, repeatedly. Sanitation – shaking or poling old nuts out of trees and mowing/discing them up -- destroys navel orangeworm that overwinter inside mummy nuts. Navel orangeworm damage can increase reject levels, costing growers substantial income. Currently, the goal of orchard sanitation is less than 2 mummy nuts per tree. Some growers in the southern San Joaquin Valley, where NOW pressure is very high, are working to reduce mummy levels to less than one mummy in two or more trees.
- **The biggest factor in predicting NOW damage this year was the level of NOW damage in the block last year.** This information comes from a huge, detailed study done by Paramount Farms in Kern County. In that same study, increased levels of NOW damage in almond were linked to the presence of pistachio orchards within 2 miles of the almond orchard. NOW is also a key pest in pistachios.
- **Navel orange worm can't get into healthy, undamaged nuts until hull split.** They will feed on mummies, aborted nuts, and "blanks" until hull split of whole, healthy nuts. NOW can grow and reproduce on remarkably poor food sources, including almond shell alone!
- **Control peach twig borers (PTB) as part of a NOW program.** PTB feeding damages nuts and NOW moths target these damaged nuts when laying eggs.
- **A "May spray" for PTB could be a good timing for NOW control.** This spray, intended to kill the first full generation of PTB in the orchard, is timed using degree day accumulation from biofix in that block. The biofix is determined using at least one pheromone trap in the orchard. It is hard to time May spray using NOW egg traps. This is an ongoing topic of research, now that pesticides that control PTB without flaring mites are available. These products included Altacor, Belt, Delegate and Intrepid. These same materials can also control NOW, although more research is needed before definite recommendations are made.

- Many of new pesticides (Altacor, Belt, Delegate, Dimilin, Intrepid, etc.) are very effective materials for PTB control in the dormant, delayed dormant, or bloom timing. They are also much less toxic to fish and other aquatic life than pyrethroids (Asana, Warrior, Baythroid, etc.) or organo-phosphates (diazinon, Lorsban, etc.) Many new pesticides have shorter REI's and PPE requirements.
- Commercially effective biological control of NOW is difficult to achieve because of the behavior of some of the beneficial insects that feed on NOW. Kent Daane, UC Berkeley entomologist reported that females of certain insect parasitoids of NOW hang around the place where they lay eggs near or on NOW and will destroy eggs of other beneficial insects to protect her unborn eggs. Kent noted that infestation of NOW with beneficial insects was often fewer than 5% in studies performed by his research group.
- **Extremely low levels of pesticides in surface water can kill fish.** Pyrethroid insecticides (Asana, Warrior, Brigade, Baythroid, etc.) can kill young salmon in the range of 1 part per billion. Organophosphate insecticides (diazinon, Lorsban, etc.) aren't much better. Careful use of these products, minimizing pesticide drift and runoff from orchards is essential to their continued availability.
- There have been some promising results with NOW pheromone puffers for mating disruption to reduce populations and damage. This technology is not a stand-alone approach, but needs to be used with pesticides to lower populations so they can be controlled by mating disruption or to protect sensitive orchard borders from high pest pressure on adjacent blocks.
- **A blind spring (May) spray for spider mites is not IPM.** David Haviland, UC Entomology Farm Advisor in Kern Co., reported that a May treatment (Agrimek, etc.) applied before mites show up in a block may not give season long control and could require a second spray closer to hull split to control spider mites going into harvest. Also, the more often a blind May Agrimek (or generic abamectin materials) spray is used, the higher the risk of spider mites developing resistance to the product. Registration of a range of new miticide chemistries – some growth regulators, some “knock down” materials -- means that resistance development should be less of a problem if growers and PCAs alternate between miticide classes. David told the audience that alert, weekly mite scouting plus the availability of new mite materials should mean that one mite spray per year – in the orchards that need a spray -- should deliver effective spider mite control. For early materials with growth regulator activity such as Envidor, Onager, Apollo, etc., wait for the mites to appear and begin to build (June?) before spraying. There are also several new knock down materials (Kanemite, Fujimite, Acramite, etc.) that are effective alternatives to Omite for late season rescue application(s).
- **Alternate effective fungicides to control diseases and resistance risk.** This was the message from Brent Holtz, UC Farm Advisor in Madera County. He reviewed common almond diseases and showed the audience photos of a new pest – almond powdery mildew. Brent reviewed resistance materials and timings for effective management based patterns of fungicide use that appear in the 2009 version of “Efficacy and timing of fungicides, bactericides, and biological for deciduous tree fruit, nut, strawberry and vine crops” available on-line at: <http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html>.

- **Effective ground squirrel management requires follow up.** Roger Baldwin, UC IPM Area advisor, made this point several times as he reviewed materials and practices for ground squirrel control in almond orchards. Habitat management, baiting, fumigation, and trapping are all at least partially effective when done at the correct time. Combining two or more of these practices, often can give the best control possible. Evaluate how your efforts are working and add a practice or modify what you are doing to get the best control.

This is just a quick review of what I remember from the class. If you see something in this report that interests you and you want to know more about it, please give me a call at (530) 218-2359.

Submitted by:

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