COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

TREE AND VINE NOTES

December 2007

2007 North San Joaquin Valley Cling Peach Day
Sponsored by
The University of California Cooperative Extension

December 13, 2007
Stanislaus County Agricultural Center

- **8:30 Welcome**
- **8:35 Update on laws & regulations for orchardists**
  - *Denny Hoeh, Stanislaus County Ag Commissioner's Office*
- **9:00 New information on zinc nutrition of peaches**
  - *Scott Johnson, Pomology Extension Specialist, UC Kearney Ag Center*
- **9:30 Monitoring OFM in pheromone-treated orchards and use of supplemental insecticides.**
  - *Walt Bentley, IPM Specialist, UC Kearney Ag Center*
- **10:00 Peach Board business**
- **10:20 Break (sponsored by American Ag Credit)**
- **10:40 Results of local chemical blossom thinning trials using ammonium thiosulfate & a surfactant**
  - *Roger Duncan, UCCE Farm Advisor, Stanislaus County*
- **11:00 Decreasing reliance on hand labor – mechanical thinning experiences in the Sacramento Valley and future UCCE efforts**
  - *Kitren Glozer, UC Davis*
- **11:30 Results of local mechanical pre-thinning efforts**
  - *Maxwell Norton, UCCE Pomology Advisor, Merced County*
- **12:00 Lunch sponsored by the Cling Peach Board**

2 hours of continuing education credits, including 0.5 hours of laws, pending

DORMANT SPRAY – PEACHES

The pesticides used in the conventional dormant spray include oil, an organophosphate or pyrethroid and copper. The target pests controlled by the oil are San Jose scale (low to moderate populations) and European red mite, the organophosphate controls peach twig borer and San Jose scale, pyrethroids control peach twig borer (not scale), and copper controls peach leaf curl. Delayed dormant spray timing (early to mid-February before bloom), is more effective than dormant spray timing for controlling San Jose scale, European red mite, and peach leaf curl. Another benefit to spraying later during the dormant period is more orchard floor vegetation in late January to mid-February reducing pesticide runoff potential.

With increasing concern and regulations regarding pesticides in surface water, growers must seriously consider their dormant spray options and management. The first step is **monitoring** for the pests by taking dormant shoot samples. These samples will help you determine the levels of San Jose scale and European red mite populations and the most appropriate pesticide and rates to use. If San Jose scale is below 10 percent, oil alone should be an effective control. If over 10 percent, then consider using an organophosphate such as Supracide or the insect growth regulator Seize. When applying organophosphates, pyrethroids, or any pesticides, they should not be applied 48 hours before a predicted rain event to avoid runoff. For the organophosphate Diazinon, the label states that it cannot be applied 48 hours before a predicted rain event or when soil moisture is at field capacity. Growers now have more dormant or bloom time control options available with newer chemistries that have reduced hazard to the environment and greater work safety; materials such as biological insecticides or insect growth regulators are replacements for the traditional broad spectrum contact pyrethroids and organophosphates.

REDUCED HAZARD DORMANT SPRAY OPTIONS

For peaches, reduced hazard insecticide programs build from the basic dormant/delayed dormant spray which is oil for scale and copper for peach leaf curl. Below are programs that have been demonstrated to be effective:

Target Insect	Reduced Hazard Material	Rate	Spray Timing
Peach twig borer	*Bacillus thuringiensis* (Bt)	1 lb or 1 qt/acre	2 bloom sprays often with brown rot timing
Peach twig borer	Spinosad (Success)	6 oz/acre 4 oz/acre	Delayed dormant or 30 -70% bloom (avoid bees)
Peach twig borer	Dimilin 2L	12-16 oz/acre	Dormant or Delayed dormant or 20 -30% bloom
Peach twig borer	Intrepid 2F	12-16 oz/acre	Delayed dormant or 20 -70% bloom
San Jose scale	Seize 35W	4 oz/acre	Delayed dormant plus 2 gal oil/acre

Bt, Spinosad, and Intrepid also control oblique banded leafroller which is an occasional peach pest. Seize applied delayed dormant with the oil and copper spray, has been very effective in reducing or eliminating scale in peach orchards where it was used on blocks with over 10 percent San Jose scale as determined from annual dormant shoot sampling. Alternating with different materials and chemistries

every year will help manage insect resistance and help ensure that our insecticide tools remain effective. Part of our IPM workshop on January 19, 2006 will cover dormant shoot sampling, insecticides and water quality.

Phytophthora and Phosphonates

By Joe Grant, UC Cooperative Extension, San Joaquin County

Many orchards, especially walnuts and cherries, have had heavy tree losses this spring and summer. Valley agriculture has reaped many benefits from the heavy rains of '04-05 and '05-06. The high rate of tree mortality in our orchards – due most likely to a combination of winter/spring root zone water-logging and increased incidence of Phytophthora root and crown rot disease – is certainly a down-side of these recent weather conditions.

The "first fronts" in combating soil saturation and infection by Phytophthora have long been and still remain 1) use of Paradox hybrid rootstock, more resistant to Phytophthora than black or English, 2) proper pre-planting site preparation (deep ripping, slip plowing, or backhoeing; grading & leveling of the site; and planting trees on raised berms), and 3) good irrigation system design, construction and operation. Tactics (2) and (3) are both aimed at avoiding prolonged periods of soil saturated conditions which kill roots directly and favor spread and infection by Phytophthora.

Phosphonates are a recent addition to the arsenal in the battle against Phytophthora. Phosphate fertilizers, which have been available for many years, are derived from phosphoric acid (H_3PO_4) and have no fungicidal activity. In contrast, phosphonates are derived from phosphorous acid (H_3PO_3) and were first found to have disease control properties in the mid – 1980s. When sprayed on foliage, injected into the water-conductive xylem tissue, or taken up by roots after chemigation through drip or microsprinkler systems, phosphonates move systematically through treated trees and their root systems.

The mechanism by which phosphonates suppress diseases caused by Phytophthora is poorly understood; there is evidence that phosphonates operate by directly suppressing the pathogen as well as by intensifying plant defense responses against the pathogen. Many phosphonate-based products are currently available but only a few companies have undertaken the time and expense to register these products as fungicides with US EPA and California Department of Pesticide Regulation. When choosing a product remember that, to be recommended and used legally, a product applied for the purpose of controlling pests (including diseases) must be registered as pesticide with USEPA and CDPR.

Research with phosphonates in walnuts and other tree crops is still in the early stages, but there is mounting evidence that phosphonate applications help reduce Phytophthora losses in tree crops. Experimental methods used to apply phosphonates have included pressurized trunk injection, application through drip or other localized irrigation systems, and foliar sprays. The results of these tests to date suggest:

- An effectively delivered phosphonate application can provide suppression for disease caused by Phytophthora for up to 3 to 5 months after application.
- Foliar phosphonate sprays have been effective in late spring, summer, and early fall, when leaves are in good condition and are actively exporting products of photosynthesis to the tree.
- Effective uptake of phosphonates applied through microsprinkler and drip irrigation systems appears to be limited to periods in summer when trees are using water rapidly.
- Foliar spraying probably is the most effective way to apply phosphonates in orchards, especially for single applications.

We will need more testing and commercial orchard experience with phosphonates to improve our understanding of the effectiveness, limitations and best uses of these materials. If we are lucky, perhaps we will be less pressed for a solution in the coming years by a return to more "normal" patterns of winter and spring rainfall less likely to promote Phytophthora outbreaks in orchards. In any case, coupled with use of resistant rootstocks and good soil/water management aimed at avoiding saturated conditions that favor Phytophthora, phosphonates

look to be an effective tool to help reduce Phytophthora losses and increase orchard life and profitability.

Prune Aphids: Life Cycles and Over Wintering Biology

By Nick Mills, Entomology Department, UC Berkeley

The life cycle of both mealy plum aphids (MPA) and leaf curl plum aphids (LCPA) is quite complex. They both spend the winter as eggs laid at the base of buds on twigs in the outer part of the canopy of prune trees. These eggs hatch in spring to produce a series of generations of aphids on the foliage through the early part of the year. Once the prune foliage has matured, (occurs earlier on older trees than on younger or more heavily irrigated trees) the aphids migrate to alternate host plants for the summer. In the case of MPA, they migrate to cattails and this normally happens in early June, but for LCPA the migration is to composite weeds and ornamentals, such as Shasta daisy, and the flight occurs in early May. Having spent the summer on their alternate host plants both aphids return to prune orchards in the fall. The first aphids to return produce nymphs that develop on the foliage into egg-laying females. These egg-laying females must then mate with returning male aphids before they move onto the twigs to lay their overwintering eggs. Each female is thought to be capable of laying only 6-7 eggs each, and these eggs must escape the attention of generalist predators if they are to hatch the following spring.

The need to develop alternatives to dormant oil sprays for the control of aphids in prunes has generated interest in a greater understanding of the timing of the phases of the life cycle that occur late in the season through winter and into early spring. From observations using yellow pan traps filled with water to collect aphids returning to prune orchards in the fall, we have found that the return migration of male aphids of both species begins in mid October and continues through November. Field observations in the fall of 2004 and 2005 confirmed that for MPA, nymphs that are destined to develop into egg-laying females can be found in small numbers on prune trees throughout November. This suggests that fall treatments for the control of MPA could be applied as late as mid November and still result in a substantial reduction in overwintering aphid eggs. However, we have not been able to find nymphs of LCPA in prune orchards in the fall and so have not been able to confirm a similar timing for this aphid species.

Monitoring Soil Moisture for Irrigation Water Management

Monitoring soil moisture is an alternate method to water-based balance methods of managing irrigation water. Using this method you can see what is going on in the soil and determine answers to some key irrigation management questions.

Includes 24 figures and 7 tables, metric conversions, and an appendix of typical root depths.

21635 $25.00

Fertigation with Microirrigation

This manual helps guide users through strategies and decision making for fertigation with nitrogen, phosphorus, potassium, and gypsum. The guide also covers the characteristics of selected fertilizers commonly used for fertigation, long and short duration strategies, how to calculate injection rates, frequency considerations, how to apply fertilizers uniformly, mixing considerations, injection devices, and how to prevent backflow.

#21620 $25.00.

Free Publications Recently Posted Online

8264 **Growing Prunes (Dried Plums) in California: An Overview**
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=8264

8267 **Olives: Safe Methods for Home Pickling**
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=8267

UC Pest Management Guidelines

Almond

Dormant Spur Sampling and Treatment Guidelines

Dormant spur sampling is used to determine the need for a dormant treatment to control San Jose scale, European red mite, brown mite and European fruit lecanium. Spurs are the short shoots containing the flower buds. Dormant spur samples are taken once a year between mid-November and the end of January.

HOW TO SAMPLE

- Randomly select 35 to 50 trees from each orchard or plot to be sampled.
- Selecting major scaffolds randomly, clip 2 to 3 spurs from the inside of each tree's canopy for a total of 100 spurs.
- Clip the spur off at the base, making sure to include some old spur wood along with the past season's growth to detect parasite activities on scales.
- Using a hand lens or binocular microscope, examine 20 of the spurs for scales and mite eggs, and record observations in a sampling form. It is not necessary to count the number of individual insects or mite eggs present, just identify the pest and record whether it is present or not.
- Note how many scales are parasitized. A parasitized scale can be distinguished from a live scale by a small hole in the top of the scale covering. Parasitized European fruit lecanium scales turn black. If a large number of scales have been parasitized, minimize the use of insecticides during the growing season and only use those that are not harmful to parasites so that naturally occurring populations will not be destroyed.

TREATMENT THRESHOLDS

- If no scale or mite eggs are found in the initial sample of 20 spurs, no more spurs need to be examined.
- If 1 to 3 spurs are infested with scale, examine the next 20 spurs.
- If 4 or more spurs are infested with live scale, apply a treatment.
- Continue examining spurs until a decision is made to treat or not to treat using the treatment guidelines on the sampling form on the online version of this guideline.

Do not combine totals for the two scale species. For example, if 3 spurs out of a sample of 20 are infested with San Jose scale and 3 spurs contain European fruit lecanium, neither has exceeded the threshold and sampling should continue. Treat for brown mite and European red mite if 20% or more spurs are infested.

Use observations of percent infested spurs to help determine what pesticides to use following the guidelines below.

Dormant Treatment Decision Table (% Infested Spurs).		
Pest	**Threshold**	**Treatment**
San Jose Scale	**Below 20%**	**No Spray**
	20 - 60%	**Oil at 6-8 gals/acre**
	Over 60%	**Oil with insect growth regulator[2]**
European Fruit Lecanium	**Below 20%**	**No spray**
	Over 20%	**Oil only**
Overwintering Mite Eggs[1] (European red or brown mite)	**Below 20%**	**No spray**
	Over 20%	**Oil only**
[1]Oil works best closer to delayed dormant timing or on warmer days when eggs are respiring. Using dormant oil only does not provide adequate control for European red mites in Kern County.		