



UNIVERSITY OF CALIFORNIA ≈ COOPERATIVE EXTENSION
SUTTER/YUBA COUNTIES,
142A GARDEN HIGHWAY, YUBA CITY CA 95991
TEL: (530) 822-7515 ~ FAX: (530) 673-5368



POMOLOGY NOTES

October, 2006

UPCOMING MEETINGS:

DATE	PROGRAM	LOCATION	CONTACT
NOVEMBER 8	2006 PRUNE CROP REVIEW	142 GARDEN HWY, Y.C.	(530) 822-7515
NOVEMBER 30	SUTTER COUNTY AG MEETINGS	142 GARDEN HWY, Y.C.	(530) 822-7503
DECEMBER 14	SUTTER COUNTY AG MEETINGS	142 GARDEN HWY., Y.C.	(530) 822-7503
MARCH 7, 2007	STATEWIDE PRUNE DAY	ORD BEND CA	(530) 865-1107

●●● PRUNE ORCHARD MANAGEMENT PRACTICES TO CONSIDER IN THE FALL:

- ❑ **IRRIGATION:** Prune trees need some water after harvest. Monitor orchard water status and irrigate if needed. Tress not irrigated between preharvest cut off and winter rains can become very dry and more vulnerable to spread of *Cytospora* canker. In addition, prune trees not irrigated after harvest can produce small fruit buds.
- ❑ **ORCHARD FLOOR MANAGEMENT:** If you flood and berm irrigate, consider not discing after the last irrigation, just knock down the berms. The ground cover will grow back faster without discing, and bare soil absorbs rainwater less readily than grass/weedy/cover cropped ground. This means more runoff – and more potential for pesticide runoff following dormant spray – from disced orchards than undiscid ground. This can mean more mustard (and mustard flowers) in the spring, so consider this in your prebloom spray program.
- ❑ **COVERCROP MANAGEMENT:** Plant cover crop now if this practice is part of your orchard management program.
- ❑ **FERTILITY:** Plan fall fertilizer program. See small article below.
- ❑ **PRUNING:** Pruning is one of the most important and expensive activities in prune orchard management. Eliminating pruning is a recipe for lots of small prunes, unless the orchard is carefully thinned. See brief article in this newsletter.

- ❑ **DORMANT SPRAY OPTIONS:** Monitor your orchard in late fall or early winter to find out if you need a dormant/delayed dormant spray. Call me (Franz at 822-7515) or look on the web at www.ipm.ucdavis.edu and click on “agriculture and floriculture” and then “prunes” to get to details of how to take a dormant spur sample.
- ❑ **MANAGE RODENTS:** gophers and especially voles can damage an orchard if not managed in the fall. Weedy cover gives voles the perfect “home” from which to feed on bark and possibly girdle trees.
- ❑ **PULL TREE BOXES** from around young trees. Boxes protect bark from sunburn and herbicides, but hold moisture against the tree when the rains come. Remove boxes in the fall once the threat of sunburn has passed and herbicide treatments have been finished.
- ❑ **CLEAN UP ORCHARDS:**
 - ✓ Cut out *Cytospora* cankers and remove infected wood from the area of the orchard.
 - ✓ Clean up “barked” trees damaged by shaker. Trunk/limb damage from harvester can result in *Ceratocystis* canker infection and possible tree death.
 - ✓ Mark dying or weak trees for removal. Backhoe out old trees, making sure to get as much of the roots out of the hole as possible.

●●● PRUNING OPTIONS ●●●

In the days of lower costs and readily available, skilled pruners, a ladders and lopers pruning job was just about automatic every fall. There was no other cost-effective option that removed fruit buds.

In 2006, costs are way up and good pruners hard to find. Shaker thinning has been developed to the point where it is a viable option for prune growers when Mother Nature puts more prunes on the trees than an orchard can size.

Prune growing seems to have become a boom or bust proposition. We have seen years (2004 and 2005) where heat at bloom severely reduced fruit set. In years like that, with 20/20 hind sight, not pruning would have been a better idea than pruning. In years like 2006 (at least in the south Sacramento Valley), many orchards set more fruit than the trees could size. Thinning would have been a good option in some blocks last year, even in some blocks that were pruned, while a good pruning job was enough to do the job in other orchards. It is my opinion that prune growers should consider a pruning program that limits the risk of too much or too little fruit next year.

Since pruning decisions must be made far ahead of crop set, a program that spreads the risk of too little or too much fruit makes sense. For example, one Glenn County prune grower divides his orchard into three similarly sized blocks and rotates a different pruning practice around the three blocks. Each block gets the following program in rotation so that in any given year one of the three blocks is in each of the following practices: Program 1: prune hard with lopers and ladders, Program 2: unpruned, and Program 3: as little topping/hedging/pruning as is possible. Every year and every block, he checks the fruit set at reference date in early May to decide if any or all of the blocks need to be shaker thinned. This program keeps total pruning cost down, and reduces the chance of producing too few or too many prunes across the whole farm.

Here are some questions I would ask myself if I were growing prunes in the Sutter/Yuba region this winter:

- ✓ Do I have the equipment, knowledge and willingness to shaker-thin if I have to?
- ✓ If the answer is “YES”, where can I go easy/eliminate pruning this winter and be ready to shaker thin if needed in 2007?
- ✓ If I’m not going to prune a block, why top it? [Zinc sulfate will defoliate trees when applied as a zinc foliar fertilizer when natural leaf fall begins in late October. This should reduce the risk of tree blowover in the fall.]

The price of prunes is not set for 2007. Good pruning will cost hundreds of dollars per acre, if good pruners can be found. Shaker thinning should cost between \$50-\$75/acre and certainly less than \$100/acre. Drying costs may go up in 2007. An integrated program of cropload management, including some combination of pruning, topping, and/or thinning, is the best way for growers to manage crop risk in 2007.

●●● FALL NUTRIENTS TO CONSIDER EVERY YEAR IN PRUNES ●●●

Nutrient	Rate	Application	Timing	Need
Nitrogen (N)	<50# N/acre	Soil	With irrigation	Based on summer leaf analysis. Fertilizer N next April can replace this treatment.
Potassium	400-500# fertilizer/acre	Soil	Shanked into ground in flood irrigated blocks.	Based on summer leaf analysis. 500# rate is a good maintenance program. For micro-irrigated blocks, wait and apply potassium in season with irrigation water.
Zinc	20-25# zinc sulfate/acre*	Foliar	At leaf fall	Based on summer leaf analysis. Spring zinc sprays work well instead of this timing, but use different materials/lower rates. Zinc in the fall will help defoliate trees if they are sprayed after first rains.

*UC recommends 10-15 pounds zinc sulfate/100 gallons of water with a dilute application. Grower experience shows 20-25# zinc sulfate in 100 gallons per acre can be effective. Higher rates may burn wood.

●●● FALL SPRAY CONTROLS PRUNE APHID THE NEXT SEASON ●●●

*Franz Niederholzer, UC Farm Advisor, Sutter/Yuba Counties, Carolyn Pickel, UC IPM Area Farm Advisor, Sacramento Valley
Rich Buchner, UC Farm Advisor, Tehama County, Bill Krueger, UC Farm Advisor, Glenn County*

SUMMARY : In three years (2003-2005) of University of California research, a fall pesticide spray consistently controlled plum aphids (leaf curl plum aphids and mealy plum aphids) the following year, providing an option to replace the dormant spray for aphid control. Options for peach twig borer and scale control are discussed.

The traditional dormant spray in prune orchards controls several key orchard pests including peach twig borer (PTB), San Jose scale (SJS), and plum aphids. However, dormant orchard spraying is increasingly regulated due to recent findings of dormant-season pesticides (diazinon, chlorpyrifos and others) in surface waters. If use of the dormant spray is eliminated or further regulated, prune growers have limited options for integrated pest

management (IPM) of plum aphids. Registered, effective pesticides for aphid control (Asana[®], diazinon, etc.) are broad-spectrum materials (non-selective poisons) that when sprayed in-season can harm beneficial insects that provide natural (and free!) spider mite and SJS control. To increase prune/plum pest control options, University of California researchers and farm advisors began to field test fall (late October – November) spray timings for aphid control. Both speed sprayer and handgun, single-tree trials were conducted. Low rates of labeled pesticides (Asana[®], Imidan[®], diazinon, and/or Actara[®]) were tested. Oil was not included with pesticides treatments, as previous studies showed it did not affect aphid control, and use of oil is incompatible with zinc sulfate, a foliar nutrient commonly applied in the fall. In all three years of this study (2003-2005), fall pesticide applications gave excellent plum aphid control the following year. There were distinct differences between pesticide materials (see Table 1) with the more persistent materials were, more effective for aphid control. In fall, 2005, at least three large scale grower tests using Asana[®] (totaling over 1000 acres), produced effective aphid control in spring 2006.

Based on these consistently positive results, prune growers can add a fall spray to their list of effective options for plum aphid control. This spray timing is very effective on the most important pest in plum/prune production. Fall spraying is generally easier to plan due to better weather conditions and could become the preferred spray timing for orchards on heavy ground where orchard access is often difficult during January and February.

While the fall spray has not yet been shown to be a complete dormant spray replacement, there are other effective options for PTB that allow growers to avoid spraying in the full dormant season (January and February). Effective PTB control practices that compliment a fall spray for aphids include a bloom spray or in-season spray with materials that don't harm beneficial insects and mites. These materials include Bt (Dipel[®], Javelin[®], etc.), Intrepid[®] and Success[®].

What about scale? Because coverage is so important in scale control, delayed dormant timing is still the best option for scale control. However, in our experience, few orchards in the Sacramento Valley have enough scale to justify spraying. A dormant spur sample is the best way to check orchard scale levels. When results of this simple test show a need for scale control, high rates of oil (4gallons/acre) can give good control of low to moderate SJS populations when applied in the delayed dormant period. An effective pesticide (Supracide[®], diazinon, Lorsban[®], Seize[®], etc.) should be added to the tank with a dormant oil if high scale populations exist. If the dormant treatment is skipped and scale is noted in spring an in-season spray with oil and/or Seize[®] can give good scale control if necessary.

TABLE 1. PLUM APHID CONTROL MATERIALS, RATES, AND RELATIVE CONTROL RESULTS WHEN SPRAYED ONCE FROM MID-OCTOBER THROUGH NOVEMBER.

Material	Rate/acre	Aphid control
Asana [®]	3*-4.8 oz	Excellent
diazinon	2 pints	Fair – Good
Imidan [®] **	2.125-4.25 pounds	Good -- Excellent
Actara [®]	3 oz	Good -- Poor

*Below labeled rate.

** Imidan was tested because it breaks down quickly in water and will have less impact on surface water quality and aquatic life than diazinon or chlorpyrifos.

●●● **PRUNE APHIDS: LIFE CYCLES AND OVER WINTERING BIOLOGY** ●●●

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.

In addition, we have been estimating the timing of egg hatch of both MPA and LCPA from examination of aphid eggs collected at regular intervals from prune orchards in the Winters area in 2004-05 and 2005-06. Before egg hatch can take place, aphid eggs must first complete an obligatory phase of overwintering diapause that is determined by chilling, in much the same way that prune buds require chilling to terminate dormancy. For MPA we estimated that diapause was completed around Jan 24 in 2005, but somewhat earlier around Jan 9 in 2006. We found sufficient eggs of LCPA in only one of these two years and estimated the end of diapause to be Feb 2 in 2006, later than that for MPA. The time taken for eggs to hatch after diapause is completed depends on the accumulation of sufficient temperature above a threshold, for egg development to reach the thermal requirement for egg hatch. The threshold temperature for development for both aphids is 37-39°F and preliminary data suggest that eggs of MPA have a higher thermal requirement for egg development than eggs of LCPA. An earlier termination of diapause coupled with a higher thermal requirement for egg hatch in MPA, with the reverse being the case for LCPA, results in a very similar timing of egg hatch for both aphid species. We estimated egg hatch to be around Feb 17 in 2005 and Feb 12 in 2006 for MPA and Feb 12 in 2006 for LCPA.

These investigations will help us to clarify the windows of activity of prune aphids both in the fall before egg laying begins and also in the spring after egg hatch. This information will be very valuable for understanding the options for timing of either pre-dormant or delayed dormant control treatments for aphids as alternatives to dormant sprays.

●●● **2006 PRUNE CROP REVIEW MEETING PLANNED** ●●●

Low chill, late bloom, wet spring, hot summer, late harvest – it all happened in 2006. There will be a meeting on Wednesday, November 8, hosted by Franz Niederholzer, UCCE Farm Advisor in Sutter/Yuba Counties, to review the 2006 Prune Crop and see what can be learned from the past year. There will be short presentations by Franz, followed by discussions of grower experiences. Research needs, based on the experiences of the 2006 crop, will also be discussed.

The meeting will be held at **Hillcrest Catering's Hillcrest Plaza Room at 210 Julia Drive in Yuba City** (see map attached). The meeting will start at **10 AM and lunch will be served at noon**. Credit hours have been requested from CA DPR. **A free lunch will be provided to those who RSVP by Monday, November 6.** After that, lunch will cost \$12/person. Please call UCCE office in Yuba City (822-7515) to RSVP.

FRANZ NIEDERHOLZER
U.C. FARM ADVISOR



2006 Prune Crop Review Meeting/Post Mortem 10:00 AM to 1:00 PM, November 8, 2006

What can be learned from a year with low chill, late bloom, wet spring, hot summer, and late harvest?

Hosted by Franz Niederholzer, U.C. Farm Advisor

Hillcrest Catering's Banquet Room, 210 Julie Drive, Yuba City, corner of Julie Drive and Clark Avenue, south of Franklin Road.



For those of you who do not know Yuba City a map is on the backside of this page.

Brief presentations of relevant research projects from this past year, group discussion of grower experiences, suggestions for further research resulting from experience(s) of 2006 crop year.

Free lunch for those who RSVP on or before Monday, November 6. \$12.00 per person for lunch at the door if no RSVP. Please call UCCE Office at (530) 822-7515 to RSVP.

Private Applicator and PCA hours requested



